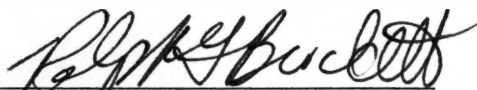
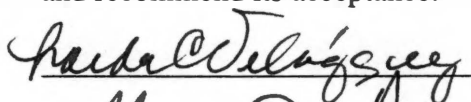
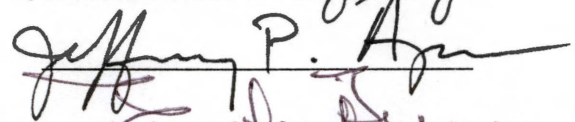
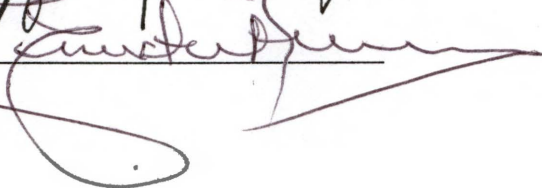


To the Graduate Council:

I am submitting herewith a dissertation written by Olga Didenko Ebert entitled "Performance of General Educational Development (GED) Recipients and High School Graduates Enrolled in a Public Research University." I have examined the final paper copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of requirements for the degree of Doctor of Philosophy, with a major in Education.


Ralph Brockett, Major Professor

We have read this dissertation
and recommend its acceptance:

Accepted for the Council:


Vice Provost and Dean of
Graduate Studies

**PERFORMANCE OF GENERAL EDUCATIONAL DEVELOPMENT (GED)
RECIPIENTS AND HIGH SCHOOL GRADUATES
ENROLLED IN A PUBLIC RESEARCH UNIVERSITY**

A dissertation presented for the
Doctor of Philosophy degree
The University of Tennessee, Knoxville

Olga Ebert

May 2002

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.E34

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Dedication

**To the people to whom this dissertation mattered most:
Mother, Mike, Pat, Dan**

In memory of my grandfather and Kenneth Ebert

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And, most importantly, I might not have not done this without my son; because everything I do, I do for him.

ABSTRACT

The General Educational Development (GED) test provides a secondary education alternative for many high school dropouts who plan to pursue further education. The purpose of this study was to determine whether academic performance differed at a state research university for GED and high school graduates and to determine the extent to which selected factors can be useful in predicting GED recipients' successful college graduation.

The study group included the total population of all the admitted freshmen between 1988 and 1998 who were GED graduates. A comparison group was selected from the population of freshmen who were high school graduates and were similar in demographic characteristics, so that the two groups differed only in the nature of their high school credential.

Several variables related to the academic performance of the study groups were analyzed. Among the findings, graduation rate was found to be significantly lower for GED graduates than for high school graduates. GED graduates' grade point average (GPA) was significantly lower in the first and the second semester, but there was no difference for the later semesters. GED graduates' completed and attempted credit hours ratio was lower in the first year. GED score was found to be an effective predictor of GED recipients' performance at the university.

This study has the potential to provide greater understanding of GED graduates' university performance in comparison to that of high school graduates. I attempted to predict whether certain variables, known at the early phase of GED graduates'

enrollment, can predict their graduation from a major university. These understandings can inform the Adult Basic Education and Student Services practice, as well as fill an existing void in the body of knowledge about the extent to which the nature of high school credentials can affect academic performance of university students.

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CHAPTER 1

Introduction to the Study

According to the Carnegie Foundation for the Advancement of Teaching (1988), the number of people taking the General Educational Development (GED) test increased by 247.3% between 1967 and 1987. This growth has not slowed in the past decade. The “concept underlying the GED tests is to provide a valid means of measuring the educational proficiency” of individuals who did not finish high school (Welch, 1980, p. 2). More and more people every year take the GED as a route to economic and educational success. A survey sponsored by the American Council on Education (ACE) in 1985 found that nearly one-half of GED takers said their main goal was to pursue further education and training (“ACE Survey Finds GED Test-Takers Seeking Advanced Education,” 1985). In 1993, this figure was almost 60% (“The Difference Age Makes,” 1995). According to Scales (1989), approximately 200,000 to 250,000 GED graduates entered postsecondary education programs across the nation in 1989, and that number has greatly increased since then (GED Testing Service, 1999).

The GED now is considered by educators to be a true and meaningful equivalent to a high school diploma preparing adults to participate in institutions of higher education requiring the credential (GED Testing Service, 1999). The Commission on Educational Credit and Credentials recommended that colleges and universities adhere to the following procedures in admitting GED holders:

1. Unless current admissions policies for high school diploma holders require a graduating class rate above the 30th percentile, equivalency credential holders should be admitted if they have met the state equivalency credential requirement based on GED test results.

2. If a higher class rank normally is required of diploma holders, the information could be used to set an appropriate minimum level for the GED average score of equivalency credential recipients. (For example, if diploma recipients are required to rank in the upper half of their graduating classes, a minimum GED average score of 50 may be an appropriate comparable standard for equivalency credential holders.) In such cases, because of the retesting limitations on the GED tests, it is suggested that alternate means (for example, *SAT*, *ACT*, CLEP local exams, interviews) be available for satisfying this requirement.
3. Where local validity studies confirm the appropriateness of GED minimum score requirements above those set for state equivalency credential, it is suggested that alternate means (for example, *SAT*, *ACT*, CLEP, local exams, interviews) be available to enable GED candidates to satisfy admissions requirements (Rogers, 1987, p. 7).

All public and the majority of private institutions of higher education now accept the above recommendations. From the official point of view of student services, the GED has become an equivalent of a high school diploma. Many GED graduates intend to use the credential to pursue further education. Cervero (1983) found that 73% of GED candidates expected the test to help them be admitted to an educational institution.

GED graduates tend to be “strongly oriented toward acquiring occupational skills” and usually enter occupational programs in community colleges (Boesel & McFarland, 1994, as cited in Boesel, Alsalam, & Smith, 1998). Kroll (1993) and Soltz (1996) agreed that the majority of GED recipients chose to take classes in two-year rather than four-year colleges. According to Kroll, however, no existing studies have demonstrated that for GED graduates, attending a community college is “a key to success in modern society... [because] only those students who attend a four-year institution can hope to rise above their economic status of origin” (p. 26). General Educational Development takers, in particular, often came from lower economic and educational backgrounds and perceived their high school and college credentials as a means to

improve their financial well being. If one agreed with Kroll that baccalaureate, rather than associate, degrees were more likely to ensure such economic improvements, then it would be important to investigate whether, in fact, GED graduates are able to be successful in baccalaureate-awarding colleges and universities. The purpose of this study is to examine GED graduates' performance in such an institution.

Several studies have examined performance of GED graduates in four-year as well as in two-year institutions and have compared their performance with that of high school graduates. Such studies are described in more detail in Chapter Two. To summarize briefly, these studies found a somewhat higher drop-out rate and lower GPA among GED graduates, particularly during the first year. Interestingly, the difference between GPA of GED and high school (HS) graduates was more pronounced in four-year institutions. In most of the reviewed studies of GED graduates' performance in postsecondary institutions, such students were found to be significantly older and more likely to be married than HS graduates. Both of these factors, as well as such characteristics as being a GED graduate, parenthood, attending part time, working full time while enrolled, are characteristics of non-traditional students (National Center for Education Statistics [NCES], 1996). Astin (1993), for example, found a positive correlation between being married and certain aspects of college academic performance and a negative correlation between being married and such characteristics as leadership, interpersonal skills, and cultural awareness. Very few studies, however, attempted to compare performance of GED and HS graduates in college who were comparable in age, family status, or employment status.

Statement of the Problem

To more fully understand whether performance of GED graduates in four-year institutions is similar to that of HS graduates, it is not enough to compare random groups of GED and HS graduates because these populations tend to differ in demographic characteristics, including age. If the study design does not control for these variables, the result represents a comparison between dissimilar samples in which differences in performance could be attributed to other non-traditional characteristics (being older, having a family) as well as to having a GED.

At this point, the researchers in adult and higher education do not have a clear understanding of the impact of having a GED, rather than a HS diploma, on college students' academic performance. The goal of this study was to address an existing gap in this area of educational research. To meaningfully compare academic performance of GED and HS graduates, I examined groups of students who, differing in the nature of their high school credential, were similar in other non-traditional characteristics (NCES, 1996).

Purpose of the Study

The purpose of the study was to determine whether academic performance and attrition rates differ for those GED and HS school graduates who enrolled at The University of Tennessee as freshmen between 1988 and 1998. Here, academic performance includes grade point average and graduation from the university with a baccalaureate degree. In addition, the study will examine the extent to which selected factors could be used to predict GED graduates' success at a major research university.

Research Questions

Nine research questions were addressed in this study. The questions were:

1. Is there a significant difference in the first semester grade point average (GPA) between GED graduates and HS graduates?
2. Is there a significant difference in the second, third, and fourth semester GPA between GED graduates and HS graduates?
3. Is there a significant difference in the number and ratio of attempted and of completed credit hours after the first semester between GED graduates and HS graduates?
4. Is there a significant difference in the number and ratio of attempted and of completed credit hours after the second semester between GED graduates and HS graduates?
5. Is there a significant difference in the rate of attrition after the first semester between GED graduates and HS graduates?
6. Is there a significant difference in the rate of attrition after the second, third, and fourth semesters between GED graduates and HS graduates?
7. Is there a significant difference in the graduation rates between GED graduates and HS graduates?
8. Is there a significant difference in the drop-out status (good standing as opposed to academic review/academic dismissal) between GED graduates and HS graduates?
9. To what extent could the combination of the GED test score, first semester GPA, second semester GPA, and first and second semester ratio of completed and attempted credit hours predict graduation rates among GED graduates?

Conceptual Framework

This study was of an exploratory nature, since no single theory or framework to date has adequately described ways in which an alternative high school credential (such as the GED) could affect academic performance of college students. Rather, the existing

literature has covered different areas contributing to an understanding of the problem that constituted the focus of the study.

Much is known about the GED test and the impact of passing the GED on the lives of adult learners. Existing research (for example, Banner, 1989; Boesel et al., 1998; Hammon, 1995; Johnson & Valentine, 1992; Murnane, Willett, & Boudett, 1995; Smith & Goetz, 1988) has suggested that outcomes of passing the GED can be summarized in the following categories: employment and income, family life, sense of self, and further education.

There existed also abundant information about adult students and their performance in colleges and universities indicating that non-traditional characteristics including an alternative high school credential or a GED make a difference in students' success in postsecondary institutions (NCES, 1996). The Beginning Postsecondary Students study (NCES, 1996), as well as other research on non-traditional students, did not look separately at the impact of having a GED as a characteristic that could potentially affect adult students' performance.

It is known that, among other factors, prior schooling did influence such an aspect of college performance as retention (Tinto, 1993). Few studies, however, have considered receipt of the GED as a "prior schooling variable" that could affect students' performance including their decision to leave college. Of those studies that did focus on GED graduates in higher education, many more investigated performance of GED graduates in community colleges than in four-year institutions.

Most of the studies that compared performance of GED graduates and high school graduates did not control for such factors as age and marital status. These findings, as a

result, told as much about differences between adult and traditional age students as they told about differences between GED and high school graduates. Because GED graduates were more likely to be older and to have families than are high school graduates, one could determine whether or not the groups are equally successful in college only by controlling for major demographic variables. This study has the potential to provide a greater understanding of GED graduates' college performance in comparison to that of high school graduates.

Significance of the Study

Existing research has tended to conclude that non-traditional characteristics generally affect college students' academic performance in some way. Most of these studies, on one hand, looked at students in community colleges and professional programs, and, on the other hand, looked at students who possessed a combination of these characteristics, without analyzing them separately.

The present investigation should contribute to a better understanding of the relationship between one of the non-traditional characteristics, receipt of the GED, and academic performance of its graduates in four-year institutions, by comparing them to HS graduates with similar demographic characteristics. I explored the college paths of GED and HS graduates to determine the points at which the performance of these students differed significantly. An attempt was also made in this study to predict whether or not certain variables, known at the early phase of a GED graduate's college enrollment, could predict successful graduation from The University of Tennessee. These results should inform the practice of student services and fill a void in the body of knowledge

concerning the extent to which the type of high school credential could affect academic performance of a college student.

Contributions to several research and practice areas are expected from this study. The practice areas included adult basic education and college student services.

Contributions to Research

Results could add to the conceptual base of understanding of the place of the GED in higher education. Although many GED graduates plan to attend college and complete a degree, it has not been quite clear how many of them are actually successful in this undertaking. Certain factors may be present in GED graduates' lives that create obstacles on their paths to success in higher education. If these obstacles and the points at which they occur were better understood, it might be possible to eventually develop a model outlining the risk and the support factors in GED graduates' college careers.

Contributions to Adult Basic Education (ABE) Practice

The study could provide answers to the question of the adequacy of preparation for the GED test, in lieu of high school attendance, for successful performance in four-year institutions. Not enough information is available for both takers and the teachers who help them on how those who pass the GED actually fare in colleges and universities. If barriers for GED graduates' successful performance in college were identified, they could be addressed in the course of preparation for the GED. Also, information about whether or not the GED score could predict success in college could be useful for GED graduates and increase their motivation in ABE.

Contributions to Student Services in Higher Education

The results of this study could suggest whether GED graduates who enroll in four-year institutions are as well prepared for the rigors of academic life as those students with similar demographic characteristics who have graduated from high school.

Illuminating particular difficulties experienced by these students can help student services professionals to develop necessary supports and to make sure that GED graduates are not left out by existing programs and services.

Limitations

The study was limited by the number of participants. This is a population, rather than a sample study, focusing on all 143 GED graduates who enrolled at The University of Tennessee between 1988 and 1998. As a result, I had no control over the demographics of the GED graduates group.

The study was also limited by the accessibility of students' records. I was able to use only information that was available in student records and could be released by the university. For confidentiality reasons, all data from the records were anonymous, and no follow-up with particular participants was possible. It was not possible to find out, for example, whether participants who left the university without graduating have subsequently enrolled in another postsecondary institution.

Another limitation had to do with the length of time needed for graduation and determining whether the participant left the university for good. It could be that some participants who appeared to have dropped out may re-enroll and eventually graduate.

Delimitation

The study was delimited by using only the sub-group of those GED graduates who successfully completed their degrees at The University of Tennessee for estimating whether GED test scores, first and second semester GPA, and first and second semester completed and attempted credit hours ratio could predict successful graduation from the university.

Assumptions

The main assumption of this study was that successful performance in a university for an undergraduate student equals graduation with a bachelor's degree. I also assumed that when a student started a semester with a certain number of credit hours, he or she, in fact, had a goal of completing that many hours. And, most importantly, I assumed that these goals applied to GED as well as to HS graduates.

Definitions

This section includes several definitions of key terms in this paper. These terms were GED; GED graduate or GED recipient; High school graduate; Grade point average; and Successful graduation.

General Educational Development (GED) – General Educational Development Test. A battery of five tests (Writing, Reading, Mathematics, Science, and Social Sciences) designed to measure the skills considered to be the outcomes of graduating from high school.

GED graduate or GED recipient – a person who obtained a certificate issued upon the successful completion of the GED test battery.

High school (HS) graduate – a person who obtained a high school diploma after the successful completion of specific units of instruction determined by the school board and passing the required examinations.

Grade point average (GPA) – measure of academic performance ratio of earned quality points to number of attempted semester hours.

Successful graduation – completion of the baccalaureate degree requirements at The University of Tennessee in compliance with its policies and procedures.

Summary

Chapter 1 has identified the purpose of the study, as well as its research questions, conceptual framework, significance, limitations, delimitations, assumptions, and definitions. Chapter 2 presents a review of the literature relevant to the study. Chapter 3 outlines research design and method. Chapter 4 discusses the findings of the study. Finally, Chapter 5 includes conclusions and implications for practice and further research.

CHAPTER 2

Literature Review

The purpose of this study was to compare the academic performance of GED graduates enrolled at The University of Tennessee with that of the sample of high school graduates attending the same institution. The previous chapter presented the study's questions, conceptual framework, significance, and limitations. This chapter includes the following sections: (a) review of research on undergraduate adult students; (b) overview of the history of the GED test; (c) outcomes associated with passing the GED; and (d) review of studies of GED graduates in postsecondary institutions, including community colleges and four-year institutions.

Adult Undergraduate Students

During the second half of the 20th century, more and more mature adults decided to continue their education in postsecondary institutions. "Ever since the GIs went back to school in the late 1940's, adult students have been increasing their importance in American colleges and universities" (Ackell, 1982, p. 30). Since the late 1970s, there has been particularly significant growth in the rate of participation of adults in college. According to many researchers (for example, Etaugh & Spiller, 1989; Kasworm, 1993; Schlossberg, Lynch, & Chickering, 1989), the population of adult college students has been growing. Over one-third of the total college population is reported to be older than age 25 (NCES, 1996). Because of this growing number of adults in classrooms, average student ages have risen, percentages of part-time and evening students have increased, and clearly observable shifts have been taking place in students' interest in curriculum and services.

There were many reasons for this phenomenon. These reasons clearly included demographic changes in the U.S. and increased life expectancy (Schlossberg et al., 1989). These and other societal factors have advanced the necessity for adult access and instruction within the higher education context. According to Kasworm (1993), these factors include:

1. The reduced size of the 18-21 population (lower birth-rates in many highly technological societies;
2. The need for increased numbers of citizens highly educated in advanced specialized knowledge beyond the current population of maturing youth;
3. The need for significant expansion of educational opportunities for adults due to the short viable life of current knowledge and the growing demands of currency of new knowledge in an information-based society;
4. Revolutionary development in technologies, particularly computer and electronic information technologies;
5. Egalitarian pressures of equity and equality within the society, with particular concern for females, hourly workers, and lower socio-economic groups;
6. National economic competitiveness in the world market, as highly influenced by the nation's university educated workforce. (p. 412)

Other trends that appeared to have facilitated adult enrollments in the United States included aging of the post World-War II baby boomers and increased work expectancy (Schlossberg et al., 1989). In addition, competitive influences of emerging nontraditional educational experiences have sensitized colleges to respond to the needs of adults, and many professional associations have convinced state legislators to promote certifications for professionals (Pappas & Loring, 1985).

Defining the Terms

There are many definitions of college students who are above traditional age and/or who have family responsibilities. "Within the literature, students in adult higher education may be referred to as older students, adult students, re-entry students, non-traditional students [both previous terms can be found spelled with or without a hyphen - O.E.], mature students, as well as part-time students, open university students, extension students, continuing education students or school leavers" (Kasworm, 1993, p. 413). The terms most often used in North American educational research are "older," "adult," "non-traditional," and "re-entry." Still, there had existed a "difficulty trying to figure out what to call ... older students - reentry, non-traditional, adult?" (Snyder, 1997, p. 5). All these terms seem to be used interchangeably in the literature of higher education. Maslow (1965, as cited in Anderson, 1972) suggested that "an adult is an essentially self-sustaining and/ or socially independent person, regardless of chronological age, and he is regarded by society and self as fulfilling an adult role" (p. 6). Cross (1980) defined the nontraditional student as an adult who returned to school full- or part-time while maintaining responsibilities such as employment, family, and other responsibilities of adult life. Knowles (1969) also suggested that responsibility and independence were the key elements of maturity. According to Knowles, a mature person has a self-concept that "moves from that of a dependent personality toward that of a self-directed organism" (p. 29). From this variety of definitions, two aspects of college student "maturity" emerge: (a) chronological age and (b) family and employment responsibilities usually associated with adulthood.

Characteristics of Adult Students

Several studies have focused on the characteristics of adult college students. An analysis conducted by the National Center for Education Statistics (1996) attempted to characterize the degree to which undergraduates were nontraditional based on the presence of seven possible characteristics. These characteristics included delaying enrollment into postsecondary education, attending part time, being independent from parents, having dependents, working full time while enrolled, being a single parent, and having a GED or high school equivalent certificate.

In another study, the following factors distinguished adult from traditional age students (Richter-Antion, 1986):

1. Sense of purpose. Whatever the purpose was (career advancement, coping with financial difficulties caused by divorce, or love of learning), the purpose was clear and represented a conscious choice.
2. Nature of time commitments. Adult students usually had more family and work responsibilities than did traditional age students.
3. Difference in life experiences. These experiences allowed the adult students to put things in a different perspective and, at times, made them challenge the professors.
4. Lack of an age cohort. Since the ages of adult students covered a broad range, they were at different developmental stages and it was difficult to generalize about them.
5. Concept of social acceptability. Adult students were “bucking the system” because they were past the socially acceptable time in their life for attending college (p. 61). However, several studies suggested that obtaining a degree can be in itself a strong social reason for participation (Knox, 1967, as cited in Anderson, 1972; Pappas & Loring, 1985).
6. Stronger consumer orientation due to the nature of adults’ financial commitment (adults more often pay for themselves). Other authors agreed with Richter-Antion (1986) that adult students tended to view their education as an investment (Benshoff & Lewis, 1992; Fisher, 1985). However, according to the

information obtained from the Office of Adult Student Services and of the Financial Aid Office at The University of Tennessee, Knoxville, approximately one-half or more of the university's adult undergraduates had their tuition cost paid by a third party.

Kasworm and Pike (1994), in their study of adult undergraduate students' academic performance, found that older adults were more likely to have entrance ACT assessment scores and high school GPAs lower than those of younger students. A greater number of older students reported transferring more than 36 semester hours from another college or university than did younger students. Older students had lower levels of interaction with other students but higher levels of interaction with faculty. Older students had higher cumulative GPAs than did younger students. The authors recommended that faculty and administrators not generalize existing traditional models of academic performance to the older adult student population:

If higher education is to serve the older adult learner effectively, colleges and universities must consider revising their admissions criteria to reflect the fact that precollege characteristics, such as high school grades and scores on admission tests, may not be accurate indicators of academic success for older undergraduates. (p. 706)

Meeks (1989) concluded that, unlike traditional-age mathematics students, no prediction equations could be developed for adult (25 years and older) students with the same major. She also found that adult students had weaker entry backgrounds and higher anxiety but also had higher motivation and higher final course grades.

A number of factors characteristically separated adult students from younger college students (Benshoff & Lewis, 1992). According to Cross (1980), adult learners tended to be achievement-oriented, highly motivated, and relatively independent with special needs for flexible schedules and instruction appropriate for their developmental

levels. Adults generally preferred more active approaches to learning and valued opportunities to integrate academic learning with their life and work experiences (Benshoff, 1991).

Metzner and Bean (1987) found that older students tended to spend more time studying, to have higher GPA, and to be less likely to drop out. They also found that, unlike younger students, adults did not attend college for socialization purposes.

Firenze (1984), in his study of educational objectives of traditional versus adult alumni, concluded that adult students valued their degrees more highly than traditional students. They also placed a higher value on learning for learning's sake. This group "could be characterized as 'life-long learners', who desire to continue their education just for the opportunity to improve themselves" (p. 14).

Hall (1990) found differences in work attitudes of traditional and non-traditional community college students. The non-traditional students scored higher on ambition, enthusiasm, and, to a lesser degree, on self-control, organization, and conscientiousness. Women, regardless of age, scored higher on all work attitude factors.

Adult students are indeed a more diverse group than "traditional" students. As people move through life, more and more biological, psychological, and social markers make them different from each other. Adult students have diverse characteristics and life circumstances that affect their participation in education (Kerka, 1989). As they handle multiple roles and responsibilities, the student role is often secondary. Compared with younger students, adults have more and varied past experiences, are more concerned with practical application, and have a greater self-determination and acceptance of

responsibility (Knowles, 1969). Perhaps the most relevant implication of these studies was that diverse groups of adult students were affected by different factors.

Needs and Concerns of Adult Students

Life events that happen “off-time from the norm are expected to bring a different response and are likely to be more stressful [for adults] than those that happen on-time” (Neugarten, as cited in Meeks, 1989, p. 5). Thus, adult students need many different kinds of support and assistance from family, friends, and institutions of higher learning. Many adult students are asked to juggle several roles simultaneously (for example, family member, parent, spouse, worker). Financial and family concerns are two major considerations that have an impact on the adult student experience (Benshoff & Lewis, 1992; Terrell, 1990; Students Services Administrator, personal communication, July 7, 1997).

Adult students, particularly GED graduates, who dropped out of high school and might have had unsatisfactory formal education experiences, could feel apprehensive about college work or being "out of place" in the college environment. According to Tinto (1993), a feeling of isolation is a big concern for adult students. In the youthful world of most colleges, older students could be marginal to the mainstream of institutional life. In both mind and body they are more likely to perceive themselves as being apart from the mainstream of college life (p. 73). When academic difficulties are experienced, it could be more difficult for adult students to readily admit that they are having problems. They may be less willing to ask for assistance in making the transition to college (Kerka, 1989).

Hu (1985) conducted a study of non-traditional students age 25 and older. His study of values and attitudes of current as well as prospective older students showed that these learners were particularly subject to family and social influences. The following factors were considered important:

1. High quality professors and good academic reputation.
2. Flexibility of program offerings and requirements.
3. Availability of evening classes.
4. Commuting from work or home.
5. Safe campus.
6. Numerous course offerings.
7. Availability of parking space.
8. Low tuition cost and financial aid.
9. Courses oriented to meet current job market demand (p. 205).

Persistence and Attrition Among Adult Students

Tinto's (1987) theory emphasized that important predictors of persistence were academic integration and social integration (participation in college life). Starks (1987, cited in Kerka, 1989) found that for adults, academic integration meant intellectual development rather than good grades, and social integration meant contact with fellow students, group work, and studying together more than participation in campus activities.

According to Metzner and Bean (1987), even though there had been a spectacular growth of adult student enrollment, these students showed a higher rate of attrition from college. Consistent with the findings of this and other studies were the findings of the longitudinal study of beginning postsecondary students (NCES, 1996). The Beginning

Postsecondary Students (BPS) national survey followed first time beginning students from the National Postsecondary Student Aid Study conducted in 1989-90. The BPS baseline data described students' experiences during postsecondary education and transition into the labor force. Transfer students, persisters, stopouts/dropouts, and vocational completers were among those who completed interviews in the first follow-up conducted in 1992. By the second follow-up, conducted in 1994, many had completed a bachelor's degree as well. The BPS survey showed that adult students were not as persistent in postsecondary education as traditional students. For example, one in three adult students left school without a credential, compared to one in five traditional students. Adult students were much less likely to earn degrees within five years of beginning their postsecondary education and far more likely to have left school without returning than were their traditional-age counterparts. The BPS study showed that among undergraduates with a bachelor's degree objective, about one-third (31%) of adult students had attained a degree within five years, compared to more than one-half (54%) of traditional students.

The National Center for Education Statistics (1996) defined seven "nontraditional characteristics" for postsecondary students: (a) delaying enrollment into postsecondary education, (b) part-time attendance, (c) being financially independent, (d) working full time while enrolled, (e) having dependents other than a spouse, (f) being a single parent, or (g) not having a standard high school diploma. Students with only one nontraditional characteristic were much more likely to have earned baccalaureate degrees (42%) than were those with two or more nontraditional characteristics (17% and 11%, respectively).

An important consideration when designing and implementing programs to reduce attrition among adult students was to determine when these students left postsecondary education. Adult students were highly likely to leave in their first year of postsecondary education (Quinn, 1986; Wilson, 1982). However, evidence from the Beginning Postsecondary Students study (NCES, 1996) suggested that the gap in attrition between adult and traditional students closed considerably from the second year on. Thus, it seemed crucial that programs aimed at reducing adult attrition rates be implemented from the very start of a student's enrollment in postsecondary education.

Implications for Student Services

Because developmental needs, issues, and stressors for adults differ considerably from those faced by younger students, all aspects of the college environment must be reconsidered and often reconfigured in response to this growing student population (Benshoff, 1991). Adults cause institutions of higher education to re-think the focus of academic and student affairs programs. Colleges are challenged to participate in the development of adults who know what they want or need to learn.

In the final report of the Commission on Non-Traditional Study (1973), the changes needed to make higher education institutions more responsive to the needs of adult students are summarized as follows:

[After the institution has completed the process of change, it] puts the students first and the institution second, concentrates more on the former's need than the latter's convenience, encourages diversity of individual opportunity rather than uniform prescription, and de-emphasizes time, space, and even course requirements in favor of competence, and where applicable, performance. It has concern for the learner of any age and circumstance, for the degree aspirant as well as the person who finds sufficient reward in enriching life through constant, periodic, or occasional study. (p. XV)

Lacefield and Mahan (1988) suggested that institutions should be prepared to work with non-traditional students not only to solve particular problems and to remove specific obstacles but also to identify, articulate, and plan to realize appropriate long-range goals and objectives. Curriculum revision plus counseling innovations appear to be necessary supplements to the recruitment of non-traditional students.

Ackell (1982) argued that increasing demands for professional curricula, especially at the graduate level, for evening and weekend classes, and for typically adult-oriented services ("mid-life" counseling, flexible requirements, childcare) all reflected the increasingly important role of non-resident students with work and family obligations who bring a different set of problems and expectations with them.

Acquisition of the GED was one of the seven non-traditional student characteristics identified by the National Center of Education Statistics (1996). Students from this group were the focus of the present study. In the next section, a brief history of the GED test will be presented, along with a discussion of outcomes for adult learners who earn this credential.

GED History and Outcomes

According to the GED Testing Service, "for more than 55 years the GED has provided a meaningful credential for more than 13.6 million adults seeking a high school diploma and for the institutions that require the credential as well" (1999, p. ii). Equivalency testing of adults was first administered in 1942 to military personnel by the U.S. Armed Forces Institute (USAFI) to "provide the opportunity for soldiers, not registered in courses but who have had comparable training experience, to take the

appraisal tests and to receive proficiency ratings if they achieve a satisfactory standing" (Allen & Jones, 1992, p. 3). A team of civilian experts directed by Ralph Tyler developed the tests to measure educational achievements in five areas: English grammar, social studies, natural sciences, literature, and mathematics. Equivalency tests were not long seen as appropriate to military personnel only. The first GED tests for servicepersons, veterans, and other adults were administered in 1947 in New York, jointly by the American Council of Education (ACE) and the State of New York Department of Education (Allen & Jones).

The 1950s were a period of slow growth for the GED Testing Service and of gradual, if somewhat reluctant, acceptance by the states. In the 1960s and 1970s, many civilian constituencies began to administer the GED (such as Job Corps and U.S. Postal Service). The tests were renormed by the ACE in 1955, 1967, 1977, and 1987. In 1987, the tests were revised, and an essay was added as a part of the exam.

The present-day GED consists of five areas: (a) Writing Skills (Part I – 55 questions, and Part II – essay); (b) Social Studies – 64 questions; (c) Science – 66 questions; (d) Interpreting Literature and the Arts – 45 questions; and (e) Mathematics – 56 questions. All questions except the essay are multiple choice with five possible answers. The complete battery takes seven and a half hours to complete, either in one day or over several days. Examinees who fail one or more of the five areas must retake and pass those sections.

Outcomes of Passing the GED

Today, for many adults who did not graduate from high school, passing the GED exam continues to be a major goal and an important outcome of independent study or

participation in basic education programs. Numerous studies have attempted to identify the outcomes of GED graduation for adult learners (see Johnson & Valentine, 1992, for an annotated bibliography of 57 reports; also see Boesel et al., 1998 and Hammon, 1995). From existing research, the outcomes of passing the GED can be summarized in the following categories:

1. *Employment and income.* There was some evidence that GED graduates experienced an increase in earning wages; however, these findings "may only apply to those who use their credential to gain access to a training program or a different job" (Murnane et al., 1995, p. 144).
2. *Family life.* Enhanced parenting skills and setting a good example for the children were often found to be related to the completion of the GED.
3. *Sense of self.* Increased self-esteem and self-satisfaction was found to be an outcome of passing the GED in all studies including these outcome variables.
4. *Further education.* Over 60% of GED graduates, according to some studies, were enrolled in postsecondary educational programs. Their performance tended to be more comparable to that of high school graduates in two-year than in four-year institutions. Some studies (for example, Smith & Goetz, 1988; Banner, 1989) found GED to be as good a predictor of college success as other admissions tests typically used with high school graduates.

It seems that many GED graduates enroll in higher education institutions. The following section explores in more detail existing research on college performance of GED graduates.

GED Recipients in Postsecondary Institutions

In this section, a review of studies on GED graduates' performance in community colleges and in four-year institutions is presented. The need for advising and support among these students is also described.

GED Recipients in Community Colleges

The pool of GED graduates applying to community colleges has been steadily growing since the 1960s (Wilson, 1982). Although the credential has enabled these graduates to enter postsecondary institutions, opinions differed as to whether or not they were adequately prepared for higher education.

Wilson (1982) attempted to discover whether GED graduates who entered Tulsa (Oklahoma) Community College were as successful academically as those with a high school diploma. At the end of the students' first semester, she looked at both groups' grade point averages, attrition, and number of hours attempted and completed. Wilson found that in their first semester, GED graduates had lower GPA than did HS graduates, especially those who were enrolled full time. More full-time HS graduates completed the attempted number of hours than full-time GED graduates. However, there was no difference among part-time students. The withdrawal rate was higher among full-time GED graduates but almost the same for part-timers from each group. The researcher thus concluded that part-time GED and HS graduates were more similar in their academic performance than were full-time students. She suggested that the number of hours GED recipients attempted in their first semester correlated directly with their ability to perform successfully in academia.

Scales (1989) compared academic achievement of HS and GED graduates in three junior colleges in Alabama, the state with the second highest school dropout rate in the nation. She compared randomly selected students' scores on the ACT, their GPA, and their grades in English I and Mathematics I. Scales found no significant differences between the ACT scores of GED and HS graduates, nor between their GPAs, English I or

Math I grades. A comparable number of GED and HS graduates were enrolled in Math I and in remedial mathematics. Scales concluded that “the GED tests were effective in producing graduates with adequate potential to succeed in college studies” (p. 97).

Soltz (1996) undertook a longitudinal study involving a group of students with GED certificates who enrolled in a large Midwestern community college. Students’ academic records were used as the primary source of data. This group essentially represented the entire population of GED recipients in the college over a 23-year period. Soltz looked at the number of GED recipients enrolled in the college, particularly those in credit courses. He also investigated what courses they took, what grades they received, how many credit hours they earned, and what their graduation rates were.

Of more than 5,000 students, over 22% took only non-credit classes. More than 4000 students enrolled in credit courses, but 24% failed to earn any credit. Of the students who did earn credits, over 83% achieved no higher than freshman status. The average cumulative GPA for the group was 1.97. However, the grades were spread across the entire range from A to F (almost 9% of the students earned GPAs of 4.00). Just 7.4% of the students with a GED, who had sufficient time to complete an associate degree, succeeded in graduating. The relatively low graduation rate, however, was similar to overall graduation rates in this college. Female GED recipients attempted and earned more credit hours and achieved a higher mean cumulative GPA than did male students.

Examination of the group’s retention levels revealed an interesting pattern. According to Soltz (1996), “a relatively high attrition rate was evident across courses in virtually all disciplines, but the students who did persist tended to achieve records indicating adequate performance” (p. 274). This suggested that although GED graduates

might not perform as well as HS graduates at the beginning of their college career, the performance of those who did not drop out was comparable to that of HS graduates.

Junne (1988) conducted a study of GED graduates enrolled in two Detroit area community colleges. In both colleges there were more female than male students and more non-White than White students. In fact, more than three-quarters of Junne's respondents were Black. Junne undertook the following:

(a) to provide a cultural, ethnical, historical, social, and familial profile of the GED entrant; (b) to indicate intentions and motivations the GED students had for returning to the educational system; and (c) to indicate the extent of colleges' success in offering educational opportunities to persons who may have been labeled underachievers or dropouts. (p. 9)

From the study of student records, the author found that percentage of GED recipients was higher among students graduating from the colleges than among incoming freshmen. In other words, the GED recipients' rate of graduation was higher than that of other students. Junne's (1988) study also had a qualitative element. Twelve in-depth interviews were conducted along with a mail survey. As a result of these interviews, the researcher became particularly interested in one group (about 25%) of respondents - Black single mothers, most of whom were welfare recipients. He described these women as being intrinsically motivated. Education was important for them, although they had dropped out of high school, mostly because of marriage or pregnancy. These individuals, according to the researcher, have exhibited a "desire to achieve success in life ...[and] should be considered for leadership positions" (p. 179).

The high percentage of Black students and of GED graduates (almost 40%) led Junne (1988) to conclude that the two colleges were serving their constituents well. He

suggested that colleges provide counseling and, if needed, advocacy for their students who were GED graduates and single mothers on public assistance.

Kroll (1993) conducted an extensive review of studies related to GED graduates' performance in community colleges. In her evaluation of these studies she stated that, first of all, community colleges were too diverse to allow for any kind of generalization of their findings. Second, she suggested that it could be appropriate, along with comparing GED and HS graduates, to compare the GED recipients who were successful in community college with GED recipients who were less successful. This would help to determine critical factors that contributed to college success. Kroll also believed that:

To conceptualize high school and GED graduates as being equal in all respects except certification status is inappropriate. There are many intervening variables such as life status and motivation that have little or nothing to do with ability or prior achievement. (p. 22)

She suggested the use of some of the large national datasets to find more general answers to questions about GED graduates' college performance.

In the context in which most people who attend community colleges do not graduate, Kroll's (1993) answer to the question, "Does earning a GED predict success in America's community colleges?" was "No, it does not, but earning a traditional high school diploma does not either" (p. 26). She raised a question about what success was and how it could be measured. Traditional measures like attrition, degree completion, or GPA would be imperfect indicators of success, especially when students' goals are not considered. Course completion or need for remedial courses as points of comparison between HS and GED graduates' performance could be more valid indicators.

GED Graduates in Four-year Institutions

There were relatively few studies examining the performance of GED graduates in universities and four-year colleges. In one such study, Colert (1983) did not find significant differences between GPA and completed credit hours for GED and high school graduates. In another study, Colert recommended special services for students with low GED scores as a way to ensure their successful performance (Colert, 1985, as cited in Sultan, 1989).

Not all studies, however, agreed with Colert's (1983) findings. A study of GED recipients who enrolled on the 13 campuses of The University of Wisconsin revealed that, as a group, high school graduates performed better than GED graduates in terms of grades, credits earned, and semesters completed (Quinn, 1986). Of almost 3000 GED holders enrolled in The University of Wisconsin system between 1979 and 1985, 35% left the university without earning any credit. Over one-fourth of GED graduates were placed in remedial courses. After four semesters, only 32% were still enrolled as opposed to 55% of HS graduates. Only 15% of GED holders reached sophomore level, and only 4% attained junior status. Quinn also analyzed correlations between students' grades and their GED scores and concluded that those scores were not predictors of success in the university. From these findings, Quinn concluded that academic performance of GED graduates may be lower than that of HS graduates.

Sultan (1989) found that two-thirds of the GED graduates who enrolled and graduated from two four-year institutions in Mississippi were females. This is consistent with findings of Colert (1983). A typical GED graduate, according to Sultan, tended to spend an average of 5.8 years in college, whereas a typical HS graduate tended to spend

4.7 years. Sultan's explanation was that "GED recipients frequently work and have families" (p. 75). Similarly, GED recipients needed an average of 13 hours to complete their majors, while HS graduates needed only an average of 11 semester hours to complete their majors. There were no significant differences between the GPA of the groups.

Advising and Support for GED Graduates in Postsecondary Institutions

One of the main purposes of research on GED holders' college performance was to gain insight for advising such students. Rogers (1987) believed that GED recipients could be expected to experience academic difficulties during their first semester of college regardless of age. He recommended advising GED graduates of the possibility of poor scholastic achievement and providing them with information via special orientation efforts about reasons for success and/or failure and with guidance, assistance, and awareness of remedial classes. He also suggested that universities should undertake follow-up studies of the GED nontraditional students to "better meet current trends for the future" (p. 82).

Scales (1989) suggested that one could not assume that just any two-year or even four-year college degree would open doors to viable employment. GED graduates enrolled in colleges needed counseling attuned to employment trends, educational programs that lead to gainful employment, and the types of counseling that encouraged program selections that provided several career options.

Several other studies revealed a need for GED graduates to have opportunities for special services and remedial courses (Colert, 1985, cited in Sultan, 1989; Grady, 1984, cited in Scales, 1989; Swarm, 1989, cited in Banner, 1989). Quinn (1986) found that in

The University of Wisconsin system, almost one-fourth of GED graduates were required to take remedial courses in mathematics, and one-fifth were required to take remedial English courses. Junne (1988) recommended that colleges provide counseling and serve as advocates for disadvantaged groups, especially low-income students with dependents.

Biermann and Platt (1992) described an integrated program known as the “GED Support Seminar” at Kingsborough Community College (a branch of The City University of New York). The program was established after Kingsborough conducted GED-related research, which indicated that “students entering with a GED diploma dropped out of college at a rate greater than students who entered college directly from high school” (p. 89). Kingsborough faculty attributed some of these students’ difficulties to “the absence of normal high school training due to the students’ lack of opportunity to integrate different disciplines... [and] stigma associated with obtaining a GED” (p. 89). The seminar was team-taught by faculty members from different departments, a counselor, and a program director and included group discussions, informational sessions, meetings with successful “role models” with GED diplomas, library work and other activities. After one semester, the program appeared to be meeting its goals, and faculty recommended that the program be extended to reach a greater number of students.

Age-related differences were often found between the samples of HS graduates and GED graduates when their college performance was compared in the reviewed literature. The next section examines these differences.

Age-Related Differences Between GED and HS Graduates Enrolled in Colleges

In most of the studies reviewed, there was an age difference between HS and GED graduates. Among the participants in Wilson’s (1982) study, 86% of HS graduates

were under 21, as compared with only 19% of GED graduates. The average ages of HS and GED graduates in community colleges were found to be 21 and 25 years, respectively (Scales, 1989). In four-year institutions, the respective ages of HS and GED graduates were 24.7 and 29.2 years (Rogers, 1987) and 24.5 and 31.4 years (Sultan, 1989).

The GED Examiner's Manual (as cited in Banner, 1989) states that GED students are considered high risk but "they are found to be more serious than the majority of non-GED students" (p. 7). According to Banner, "the average GED student is about ten years older than the average college freshman" (p. 6). Interestingly, when Banner compared her results with those of Colert (1983) and Rogers (1987), she found the mean age of GED graduates to be 24 in her study, compared with 26 in Colert's study and 30 in the investigation by Rogers. The GPA, on the other hand, was the highest in her study and lowest in Rogers's. Although Swarm (1989, as cited in Banner, 1989) found that "older students tended to perform better than younger students" (p. 15), comparison of Banner's, Colert's, and Rogers's findings seemed to indicate that the younger GED graduates were, the better they performed in college.

A 1995 GED Testing Service statistical report revealed that:

The greatest effect of age on GED candidates pertains to the likelihood that they will take the GED test: although almost 91% of U.S. high school dropouts are 25 years of age or older, only 37% of GED candidates are in that age group. ("The Difference Age Makes," 1995, p. 60)

Although the motivation to continue learning was high in both age groups, younger candidates were more likely than older ones to plan to attend college, while older candidates were more likely to plan to engage in self-directed learning. A factor that

could partially account for this difference was that GED candidates between 18 and 25 years of age were far more likely to have completed Grade 11 or higher. This finding is similar to those of a study by Thompson and Jimmerson (1986), who found that few of the older GED graduates reported acquiring benefits for entering college. The GED was seen as the most beneficial for further education by the 22-30 year old group. In terms of actual test performance, age did not appear to make a difference (except the higher average score of candidates ages 45 to 54 on the Test of Interpreting Literature and the Arts) ("The Difference Age Makes," 1995).

Synthesis of data on student persistence suggested that "the longer it takes to graduate from a program or institution, the smaller the proportion of GED recipients who graduate, relative to HS graduates" (Boesel et al., 1998, p. 43). Generally, GED graduates completed fewer years of postsecondary education than did HS graduates. In all, Boesel et al. concluded that "GED recipients are less likely than high school graduates to persist in postsecondary education, whether persistence is measured by individual attainment rates, institutional attainment rates, or years of college completed" (p. 45). Interestingly, those authors also found that the mean grade-point average of both GED and HS graduates increased with student longevity in vocational and two-year institutions. In four-year colleges the GPA remained the same for all years as it was for the freshman year, although it was higher for those who graduated. The authors suggested as an explanation that "more rigorous selection procedures in the 4-year colleges identified and excluded weak candidates before admission rather than afterward, in contrast to procedures in 2-year colleges and vocational schools" (p. 39).

Conclusion

According to Soltz (1996), a number of researchers (Cervero, 1983; Sabino & Seaman, 1988) that focused on college-level work of GED holders have suggested that, as a group, these students performed adequately and in many instances at a level equivalent to that of high school graduates or higher. However, other reports have indicated that GED holders did not perform as well in college as HS graduates (Quinn, 1986; Rogers, 1987; Schillo, 1990, as cited in Soltz, 1996). Lack of agreement across studies, concluded Soltz, was probably due to numerous factors, including “differences in characteristics (age, gender), background, settings (community vs. four-year college), and the amount of time students in a given study spent in higher education. Given the descriptive nature of most of these studies, definitive conclusions are not possible” (p. 270).

The overall picture of academic performance of GED graduates in U.S. colleges and universities, as compared with high school graduates, seemed far from clear. Multiple variables other than the nature of the credential could affect what successful performance in college meant to the two groups and could account for differences between the groups. The meaning of successful performance could also differ between community colleges and four-year institutions. For example, not all students had a goal of receiving a college degree, and for some, success did not equal graduation. Realizing the uncertainty of these and other assumptions, the following conclusions are offered based on the review of the studies on GED graduates’ college performance:

1. The Grade Point Average of GED and HS graduates who persist in postsecondary education seems to be generally more comparable in two-year than in four-year institutions.

2. There are indications that female GED graduates tend to participate in postsecondary education more often, particularly in four-year institutions, and be more academically successful, as determined by traditional measures of success.
3. GED graduates enrolled in colleges are usually older than HS graduates.
4. Attrition and academic failure tend to be higher among GED recipients than among HS graduates, particularly in the first year of enrollment. The differences both in grades and in retention tend to decrease over the years of attendance.
5. GED score could predict academic success as well as ACT scores. However, neither of these scores may be called really effective predictors, unless performance on a particular GED section is correlated with academic achievement in a particular program of study. More research is needed in this area.
6. Based on the literature reviewed, it appears that most of the research on GED graduates' academic performance is quantitative. In order to more fully understand the difficulties these learners encounter in college, more qualitative studies are needed.
7. Although many GED takers indicate that enrollment in postsecondary education is one of their main goals, those who do enroll often drop out within a year. There is a possibility that such students are still being exposed to the same outside forces that led them to drop out of high school (such as poverty, single parenthood, insufficient basic and study skills). More studies on the importance of these factors for predicting GED graduates' academic performance would help to understand how to improve their retention and performance.
8. There seems to be a need for special services (support, advising) and for remedial courses for GED graduates. These could be especially effective if they took into consideration the above-mentioned "outside forces" acting on such students.

The research reviewed in this chapter has informed the direction of the study by revealing contradictory findings about the equivalency of the GED to high school completion as a means of preparation for postsecondary education, especially in four-year institutions. Overall, it seems that the GED graduates may experience some difficulties

during their freshman year that prevent them from being as successful in college as HS graduates. However, most of the studies reviewed usually compared *younger* HS graduates to *older* GED recipients. Very little, in fact, is known about comparability of performance of GED and HS graduates of *similar* age, particularly in four-year institutions. This study attempted this comparison utilizing methodology outlined in the following chapter.

CHAPTER 3

Method

The previous chapter looked at existing studies comparing college performance of General Educational Development (GED) and high school (HS) graduates. It was noted that most of these studies focused on two-year colleges rather than on universities. The present study, however, investigated academic performance of these two groups at The University of Tennessee, Knoxville – a large public research university. In the course of the study I examined academic records of all GED graduates who enrolled in The University of Tennessee as freshmen between 1988 and 1998. These records were compared with those of a stratified random sample of HS graduates enrolled in the university during the same years. Data were statistically analyzed to more fully understand whether or not the academic performance of GED graduates was different at The University of Tennessee from that of high school graduates. This chapter describes the study population and sample, research design, data collection, and data analysis procedures. This methodology for data analysis utilized in this study was quantitative.

Population and Sample

The study group is a total population (143 students) of all first-time freshmen who were GED graduates, admitted to The University of Tennessee in the fall semesters between 1988 and 1998. A comparison group of 148 HS graduates was randomly selected from a much larger population (stratified by age) of 37,015 fall freshmen from the same years. The section on data collection describes in more detail the process for selecting the sample.

Research Design

This was an ex post facto study, utilizing already existing sources of information for its data. In this case, the data on demographics, attendance, graduation, and GPA for both GED and HS groups were collected with the help of the Office of Student Records and Enrollment Data at The University of Tennessee. Due to the university policy that preserved the confidentiality of student records, all data were given to me without identifiers. The data were given in the form of student transcripts without names, addresses, or Social Security numbers. Therefore, it was not possible to follow up with these students, nor would it be possible to collect additional information from their records in the future.

Because student transcripts could not be taken out of the Office of Student Records, the relevant information was transferred from the transcripts into a table designed by me. The data were subsequently entered into a Statistical Package for Social Sciences (SPSS) (Norusis, 2000) database with 24 original key variables defined by me (see Appendix). Additional variables were computed or recoded, as needed, in the course of the data analysis. For example, the variables representing ratio of completed and attempted semester credit hours were computed by dividing the number of semester's completed hours by the number of attempted hours. All subsequent analyses were conducted utilizing Statistical Package for Social Sciences.

Variables

The current investigation focused on several dependent and independent variables. Several demographic variables were included to compare groups.

Independent Variables

Status. GED graduate or high school graduate

GED score. The composite score on a scale of 20 to 80. The composite is the mean of the five sections on the GED test: Writing Skills, Mathematics, Social Studies, Science, and Interpreting the Literature and the Arts. The American Council on Education's (ACE) Commission on Educational Credit and Credentials sets the minimum requirements for issuing a GED credential. To pass the GED, test-takers must earn a minimum score of 40 on each test and an average score of at least 45 on all the tests in the battery. Jurisdictions may set their standard higher than, but not lower than, this level.

ACT score. The composite score on a scale from 1 to 36. The composite is the mean of four test scores (English, Reading, Mathematics, and Science Reasoning), rounded to the nearest whole number.

Dependent Variables

Semester grade point average (GPA). A standard end-of-semester measure used at The University of Tennessee. This variable was further broken down into the first four semesters' GPA.

Credit hours. Ratio of completed/attempted semester credit hours. This variable was further broken down into first and second semester of the first year credit hour variables. It would have been desirable to also have the credit hours data for the third and fourth semesters. However, the original research question focused on the first two semesters only, and the confidential nature of the data collection procedures made unfeasible a later attempt to collect additional information.

Attrition. The rate of decrease in number of students after completion of a semester. This variable was further broken down into the first four semesters attrition variables. For the purposes of this study, three categories of student attrition were defined for each semester:

1. *Enrolled* indicated that the student's GPA for that semester was other than 0.0 or that the GPA was 0.0 but the student either had a GPA or withdrew in the subsequent semester.
2. *Withdrew* indicated that the student withdrew during the semester but later returned and had recorded GPA for the subsequent semester(s).
3. *Dropped out* meant that either there was no GPA at all for the semester (including withdrawals), or the GPA was 0, and there was no GPA for subsequent semester(s). This category included those students who left the university and, during the time of the study, did not re-enroll.

Graduation. Whether or not the student has graduated from The University of Tennessee. This variable did not apply to those students who enrolled in the university in 1998 and, therefore, had not completed four full years by the time of data collection.

Drop-out status. The status of a student at the time of leaving the university: Good Standing, Academic Review, or Academic Dismissal. This variable did not apply to those students who graduated or to those who were still enrolled in the university at the time of data collection.

Demographic Variables

Several demographic variables were included strictly to ensure the comparability of the data. The ACT scores were also used for that purpose. The demographic variables were age, race, gender, and marital status. These variables were analyzed only to provide a profile for the sample and not to determine whether they were related to students' academic performance.

Data Collection Procedures

The first step in collecting the data was made by the author's initial doctoral committee chair, who contacted the Dean of the Admissions and Records Office at The University of Tennessee and requested assistance in data collection. Because of the university's confidentiality policy, it was impossible for the author to have direct access to the data. All data were collected by the staff of the Office of Student Records and Enrollment Data from student records for all GED graduates who enrolled at The University of Tennessee as freshmen during fall semesters in the years 1988-1998. The following information was collected: student age; gender; race; ACT/SAT scores and GED scores for the GED group; first, second, third, and fourth semester GPA; number of attempted and completed hours after the first and the second semester; enrollment status after the first semester, second, third, and fourth semester and at the time of data collection (summer 2001); graduation status; graduation GPA for those who graduated and the last cumulative GPA for those who did not.

Identical data (with the exception of the GED scores) were collected for a matched comparison group of high school graduates who also entered the university as freshmen during fall semesters between 1988 and 1998. The age distribution of the GED graduates was determined to be the following: 44% were between 17 and 20 years old; 32% were between 21 and 25; 10% were between 26 and 30; 10% were between 31 and 40; and 4% were older than 40. A comparison group of 455 HS graduates was randomly selected from a much larger population of freshmen from 1988-1998. This random sample was stratified by age, so that there were a comparable number of subjects in the age groups listed above.

The comparison group sample was reduced further to 148 using the following criteria: demographic characteristics of the sample were to match those of the population of GED graduates (age, race, gender, marital status). The sample reduction was done randomly, with a plan to use the larger sample as a pool for substitutions if the reduced sample would not be comparable to the GED group on the demographic criteria. No substitutions were necessary, however, because the reduced random sample proved statistically comparable to the GED group.

Marital status was the only demographic variable that presented a difficulty for data collection. Although this information is supposed to be collected by the University for all incoming freshmen, it appears to have been an “optional” field on the application form and, therefore, was available only on a limited number of the records for both groups. I turned to the Financial Aid Office of the university as the only university source for missing marital status data (this information was seen as crucial for the comparability of the two groups). The Financial Aid Office was able to provide this information but only for students who applied for Financial Aid. As a result, marital status data were available for 69% of the GED graduates and for only 47% of the HS graduates. No other source of data was available to retrieve the missing information.

It would have been desirable also to control for ACT scores, but these were available only on a limited number of records because of the existing university policy that did not require college admission test scores for applicants who have been out of formal schooling for at least three years. ACT scores were available for 48% of the GED group and for 56% of the HS group. GED scores were also collected for all GED graduates.

Data Analysis

To ensure comparability of the two groups, demographic characteristics were analyzed using Chi-square for nominal variables such as race and marital status and *t*-tests for interval level variables such as age and ACT score. Independent samples *t*-tests were performed to compare interval variables such as GPA of GED recipients and of the comparison group. All research questions discussed below were introduced in Chapter 1. The following research questions were answered using *t*-tests:

1. Is there a significant difference in the first semester grade point average (GPA) between GED graduates and HS graduates?
2. Is there a significant difference in the second, third, and fourth semester grade point average (GPA) between GED graduates and HS graduates?

Credit hours were proposed originally to be analyzed using a *t*-test. However, neither the number of credit hours attempted nor the number of hours completed by each group were normally distributed; therefore, their ratio was analyzed using a nonparametric Mann-Whitney U test. The following questions were answered using this test:

3. Is there a significant difference in the number and ratio of attempted and completed credit hours after the first semester between GED graduates and HS graduates?
4. Is there a significant difference in the number and ratio of attempted and completed credit hours after the second semester between GED graduates and HS graduates?

To analyze data on attrition, graduation rates, and the drop-out status, chi-square tests were performed. The following questions were answered using chi-square:

5. Is there a significant difference in the rate of attrition after the first semester between GED graduates and HS graduates?

6. Is there a significant difference in the rate of attrition after the second, third, and fourth semesters between GED graduates and HS graduates?
7. Is there a significant difference in the graduation rates between GED graduates and HS graduates?
8. Is there a significant difference in the drop-out status (good standing as opposed to academic review/academic dismissal) between GED graduates and HS graduates?

The last question was analyzed using logistic regression, a procedure used to predict the probability of an event happening, based on values of a set of predictor variables. This procedure is similar to a linear regression model but is suited to models where the dependent variable is dichotomous (in this case, graduation from The University of Tennessee). Logistic regression coefficients can be used to estimate odds ratios for each of the independent variables in the model (Hosmer & Lemeshow, 2000; Norusis, 2000).

9. To what extent can the combination of the GED test score, first semester GPA, second semester GPA, and first and second semester ratio of completed and attempted credit hours predict graduation rates among GED graduates?

Summary

This chapter has outlined the design and the method of this investigation. Several different statistical procedures were used. The following chapter will discuss in detail the research findings of the study.

CHAPTER 4

Findings

The previous chapter outlined the method used to study the data collected from the records of the 143 General Educational Development (GED) graduates and 148 high school (HS) graduates who enrolled at The University of Tennessee as freshmen during fall semesters between 1988 and 1998. This chapter presents the findings of this data analysis that enabled me to answer the nine research questions and to compare the demographics of the two groups.

Demographic Profile

To ensure comparability of both groups, demographic characteristics were compared utilizing two tests. Chi-square tests were used to compare the two groups' gender, race, age (by age groups), and marital status, while independent samples *t*-tests were used to compare average age and ACT scores. Marital status and ACT data were not available for all the participants, as explained in Chapter 3. No significant differences were found between the two groups on any of the demographic variables. This suggested that the two groups were similar overall in their demographic composition. Table 1 summarizes demographic information for all the participants. Table 2 presents results of the Chi-square analysis of these differences.

Interval level variables (age and ACT score) were analyzed using *t*-tests. The results of this analysis are presented in Tables 3 and 4.

Table 1

Demographic Profile of the GED and the HS Graduates

Variable		GED graduates		HS graduates	
		N	%	N	%
Gender	Women	54	37.8%	62	41.9%
	Men	89	62.2%	86	58.1%
	Total	143	100.0%	148	100.0%
Race	White	127	89.4%	113	86.3%
	Non-White	15	10.6%	18	13.7%
	Total	142	100.0%	131	100.0%
Age	17-20 years	63	44.1%	62	41.9%
	21-25 years	45	31.5%	42	28.4%
	26-30 years	15	10.5%	13	8.8%
	31-40 years	14	9.8%	25	16.9%
	41 or older	6	4.2%	6	4.1%
	Total	143	100.0%	148	100.0%
Marital status (for available data)	Married	22	22.4%	11	15.5%
	Unmarried	76	77.6%	60	84.5%
	Total	98	100.0%	71	100.0%

Table 2

Chi-square of Gender, Race, Age, and Marital Status

Variable	Chi-square	df	Significance
Gender	.52	1	$p = .47$
Race	.65	1	$p = .42$
Age in groups	3.27	4	$p = .51$
Marital status	1.27	1	$p = .26$

 $\alpha \leq .05$

Table 3

Mean Ages and ACT Scores of the GED and HS Graduates

Variable	GED graduates		HS graduates	
	N	Mean	N	Mean
Age (in years)	143	23.8	148	24.3
ACT score	69	22.7	84	22.1

Table 4

T-tests of Age and ACT Scores of GED and HS Graduates

Variable	<i>t</i>	<i>df</i>	Significance
Age	-.60	289	$p = .57$
ACT score	.84	149	$p = .40$

 $\alpha \leq .05$

Tables 1 and 3 show the demographic composition of the two groups. In both groups, there were more male than female students: 62.2% of the GED graduates and 58.1% of HS graduates were male. The majority of participants in both groups were white: 89.4% among the GED graduates and 86.3% among the HS graduates. Among the students with known marital status, only 22.4% of GED graduates and 15.5% of HS graduates were married. The average age for both groups was approximately 24 years, indicating that these participants were older than traditional-age incoming college freshmen. The ACT score was available for approximately one-half of the students in both groups and was 22.7 for the GED graduates and 22.1 for the HS graduates. These data show that the two groups were indeed comparable in their demographics.

Exploring the Research Questions

Nine research questions were identified for this study. The findings presented in this section include the questions related to the participants' grade point average, credit hours, attrition, and graduation from the university. Some questions are presented together because they examine the same variables at different times, for example, grade point average during several semesters.

Grade Point Average Research Questions

The first set of research questions is concerned with comparing grade point averages of the two groups. Two research questions are addressed in this section.

Research Question 1. Is there a significant difference in the first semester grade point average (GPA) between GED graduates and HS graduates?

Research Question 2. Is there a significant difference in the second, third, and fourth semester GPA between GED graduates and HS graduates?

To compare the two groups' grade point average (GPA), independent samples *t*-tests were used. For the GED graduates, the average first semester GPA was 1.98, while for the HS graduates, it was 2.51 ($t = -3.41$). This difference is significant at the .01 level.

The difference between the second semester GPA was also significant at the .01 level: for GED graduates, the second GPA was 1.85 and for the HS graduates, 2.4 ($t = -3.08$). There were, however, no significant differences between the groups in terms of their third and fourth semester GPA. Table 5 summarizes the results of the GPA comparison.

Table 5

Grade Point Average of GED and HS Graduates

Variable	GED graduates		HS graduates	
	N	Mean GPA	N	Mean GPA
First semester GPA	129	1.98**	139	2.51**
Second semester GPA	104	1.85**	108	2.40**
Third semester GPA	71	2.23	89	2.51
Fourth semester GPA	62	2.27	80	2.54

Note: **Differences between GED and HS groups are significant at .01 level

Table 6

Independent Samples t-tests for Differences Across Four Semester GPA of the GED and HS Graduates

Variable	t	df	Significance
First semester GPA	-3.41	248	$p = .001$
Second semester GPA	-3.08	205	$p = .002$
Third semester GPA	-1.36	121	$p = .176$
Fourth semester GPA	-1.34	111	$p = .183$

$\alpha \leq .05$

In the first semester, the GPA of GED graduates was 1.98 and of HS graduates, 2.51. In the second semester, the GPA of GED graduates was 1.85 and of HS graduates, 2.4. In the third semester, the GPA of GED graduates was 2.23 and of HS graduates, 2.51. And in the fourth semester, GED graduates' mean GPA was 2.27, and HS graduates' mean GPA was 2.54. These results suggest that in the first and second semesters of enrollment at The University of Tennessee, the GPA of GED graduates was significantly lower than that of the HS graduates. However, for those students who persisted through the third and the fourth semesters, no significant differences were found between the two groups. It is also notable that the HS group's average GPA remained approximately the same during the four semesters (ranging from 2.4 to 2.54), while within the GED group, the GPA was somewhat lower during the first and second semesters (1.98 and 1.85, respectively) than during the third and the fourth semesters (2.23 and 2.27, respectively).

Attempted and Completed Credit Hours Research Questions

The following two questions pertain to the attempted and completed credit semester hours for students from the two groups. These data are compared for GED and HS graduates.

Research Question 3. Is there a significant difference in the number and ratio of attempted and of completed credit hours after the first semester between GED graduates and HS graduates?

Research Question 4. Is there a significant difference in the number and ratio of attempted and of completed credit hours after the second semester between GED graduates and HS graduates?

The ratio of completed and attempted credit hours for the first and the second semester was calculated by dividing the number of completed hours by the number of

attempted hours. Originally, it was proposed to analyze the differences in the ratio by utilizing *t*-tests. When analyzed using independent samples *t*-tests, significant differences were found between completed/attempted credit hours ratio of the two groups in the first semester but not in the second semester ($t = -3.69$ and $t = -1.18$, respectively).

It was noticed, however, that the ratio scores in the sample were not normally distributed. Because of the non-normal distribution of the ratio scores, differences were also analyzed using a non-parametric (Mann-Whitney U) test. In this analysis, significant differences were found between the groups in terms of the completed/attempted hours ratio in both first and second semester. For the high school graduates, the average first semester ratio was .83 (meaning that out of all the credit hours attempted by these students, 83% were actually completed), while for the GED graduates 67% of attempted hours were completed (MWU = 6952.5). In the second semester, high school graduates completed 78% of attempted hours, and GED graduates completed 66% (MWU = 4406.5). The means of attempted and completed hours are presented in Table 7 and results of the analyses, in Table 8.

It can be concluded from Table 8 that the GED graduates completed a significantly smaller percentage of the credit hours they attempted in their first and second semesters than HS graduates. It is also worth noting that overall, GED graduates attempted fewer credit hours than HS graduates. In the first semester, GED graduates attempted, on the average, 9.51 credit hours, while HS graduates attempted 10.14 hours. This difference was not significant. In the second semester, however, the difference in

Table 7

Attempted and Completed Credit Hours for the GED and HS Graduates

Credit hours	GED graduates		HS graduates	
	N	Mean	N	Mean
First semester	131		142	
Attempted		9.51		10.14
Completed		6.58		8.56
Ratio		.67**		.83**
Second semester	104		113	
Attempted		10.51		11.63
Completed		6.46		9.37
Ratio		.66**		.78**

Note: **Differences between GED and HS groups are significant at .01 level

Table 8

Mann-Whitney U tests of Differences in the Ratio of Completed and Attempted Credit Hours Between the GED and HS Graduates

Variable	MWU	Significance
First semester ratio	6952.5	$p < .001$
Second semester ratio	4406.5	$p = .001$

$\alpha \leq .05$

attempted credit hours between the two groups was significant at the .05 level: 10.51 hours for GED graduates as opposed to 11.64 hours for HS graduates.

Attrition and Graduation Research Questions

The next section addresses research questions related to attrition and university graduation of GED and HS graduates. It also examines age-related differences within both groups.

Research Question 5. Is there a significant difference in the rate of attrition after the first semester between GED graduates and HS graduates?

Research Question 6. Is there a significant difference in the rate of attrition after the second, third, and fourth semesters between GED graduates and HS graduates?

Research Question 7. Is there a significant difference in the graduation rates between GED graduates and HS graduates?

For the purposes of this study, three categories of student attrition were defined for each semester. The categories were “enrolled,” “withdrew,” and “dropped out.”

1. *Enrolled* indicated that the student’s GPA for that semester was other than 0.0 or that the GPA was 0.0 but the student either had a GPA or withdrew in the subsequent semester.
2. *Withdrew* indicated that the student withdrew during the semester but later returned and had recorded GPA for the subsequent semester(s).
3. *Dropped out* meant that either there was no GPA at all for the semester (including withdrawals), or the GPA was 0 and there was no GPA for subsequent semester(s). This category included those students who left the university and, during the time of the study, did not re-enroll.

Chi-square tests were used to compare initial attrition and graduation rates of both groups. During the first semester, 14% of GED graduates and 10.1% of HS graduates dropped out of the university. By the end of the second semester, the cumulative attrition (drop-out rate) was 34.3% for GED graduates and 28.2% for HS

graduates. The third and fourth semester cumulative attrition was, respectively, 52.4% and 59.4% for GED graduates and 38.5% and 46.6% for HS graduates. During the first two semesters, there was no significant difference in the drop-out rate between the GED and HS graduates, although during each of these semesters more GED graduates than HS graduates left the university. By the third semester the difference in cumulative attrition between the two groups became significant and was also significant during the fourth semester. These data are summarized in Table 9.

Table 9 illustrates the stages of attrition of both GED and HS graduates during the first four semesters of their enrollment at the university. There were 143 GED graduates and 148 HS graduates who enrolled at the university as freshmen. At the end of the first semester, 114 GED graduates and 132 HS graduates remained enrolled; 9 GED graduates and 1 HS graduate withdrew (but later re-enrolled) and 20 HS graduates and 15 HS graduates dropped out. At the end of the second semester, 90 GED graduates and 104 HS graduates remained enrolled; 4 GED graduates and 2 HS graduates withdrew; and 29 GED graduates and 27 HS graduates dropped out. A total of 49 GED graduates and 42 HS graduates dropped out during first two semesters. At the end of the third semester, 65 GED graduates and 89 HS graduates remained enrolled; 3 GED graduates and 2 HS graduates withdrew; and 26 GED graduates and 15 HS graduates dropped out. A total of

Table 9

Attrition and Graduation

Attrition stages	GED graduates		HS graduates	
	(N)	%	(N)	%
Enrolled as freshmen	143	100.0	148	100.0%
Enrolled during first semester	114	79.7	132	89.2%
Withdrew during first semester	9	6.3	1	.7%
Dropped out during first semester	20	14.0	15	10.1%
Enrolled during second semester	90	62.9	104	70.3%
Withdrew during second semester	4	2.8	2	1.4%
Dropped out during second semester	29	20.3	27	18.2%
Dropped out during the first two semesters	49	34.3	42	28.3%
Enrolled during third semester	65	45.5 *	89	60.1% *
Withdrew during third semester	3	2.1	2	1.4%
Dropped out during third semester	26	18.2	15	10.1%
Dropped out during the first three semesters	75	52.5	57	38.4%
Enrolled during fourth semester	57	39.9 *	78	52.7% *
Withdrew during fourth semester	1	.7	1	.7%
Dropped out during fourth semester	10	7.0	12	8.1%
Dropped out during four semesters (total)	85	59.4 *	69	46.6% *
Dropped out after the fourth semester	34	23.7	29	19.6%
Graduated (out of those enrolled before 1998)	20	14.2 *	40	29.6% *
Enrolled Spring or Summer 2001	4	2.8 *	10	6.6% *

Note: * Differences between GED and HS groups significant at .05 level

**Differences between GED and HS groups significant at .01 level

75 GED graduates and 57 HS graduates dropped out during the three semesters. At the end of the fourth semester, 57 GED graduates and 78 HS graduates remained enrolled; 1 person from each group withdrew; and 10 GED graduates and 12 HS graduates dropped out. A total of 85 GED graduates and 69 HS graduates dropped out during the four semesters. Additionally, 34 GED graduates and 29 HS graduates dropped out of the university after the four semesters. There were 4 GED graduates and 10 HS graduates still enrolled at the university at the time of data collection.

Out of the 141 GED graduates who had had at least four years to graduate from the university (those admitted before 1998), only 20 (14.2%) have graduated. Out of the 135 high school graduates, who had no less than four years to graduate, 40 (29%) have graduated.

Chi-square tests were used to determine whether there were differences in attrition and graduation between GED and HS graduates. Because of the small number of participants who withdrew during each semester, the withdrawal data were not compared between groups. However, it is worth noting that it seems that more GED graduates than HS graduates withdrew in the first semester (6.3% of the former and .7% of the latter). To compare graduation rates, the participants who entered the university in 1998 were excluded from the analysis because they did not have sufficient time to graduate. Table 10 presents results of the Chi-square analysis of the differences between GED and HS graduates in terms of their attrition in the first, second, third, and fourth semester.

No significant differences were found between the two groups in their first and second semester rate of attrition. However, by the end of the third semester, significantly more GED graduates than HS graduates left the university. The difference in attrition was

Table 10

Chi-square of Differences Between GED and HS Graduates in the First Four Semester Attrition and Graduation

Variables	Chi-square	df	Significance
First semester attrition	1.4	1	$p = .23$
Second semester attrition	1.4	1	$p = .24$
Third semester attrition	6.1	1	$p = .014$
Fourth semester attrition	4.8	1	$p = .028$
Graduation	9.9	1	$p = .002$

$\alpha \leq .05$

also significant at the end of the fourth semester, and significantly more HS graduates than GED graduates received a baccalaureate degree.

Based on information obtained from a staff member of the Office of Institutional Research at The University of Tennessee (personal communication, September 2001), overall graduation rates for undergraduate students at The University of Tennessee for students enrolled in fall semesters of 1990-1993 were in the following ranges:

1. The 4-year graduation rate for students who enrolled in the fall semesters of 1990, 1991, 1992, and 1993 ranged from 22.6% to 25.1%.
2. The 6-year graduation rate for students who enrolled in the fall semesters of 1990, 1991, 1992, and 1993 ranged from 54.7% to 56.9%.

For the university overall, there was more than a double increase from four-year to six-year graduation rate. However, there was no such increase for the study groups. Out of the 123 GED graduates with at least six years to graduate from the university (those admitted before 1995), only 20 (16.3%) have actually graduated. Out of the 112

high school graduates who had had no less than six years to graduate, 40 (35.7%) have graduated.

These results suggest that significantly fewer GED graduates than HS graduates were able to graduate from The University of Tennessee. Depending on the time of their enrollment, the students from this sample had between four and ten years to graduate. Table 11 presents a summary of how long it took students from both groups to graduate.

No significant differences were found between GED graduates and HS graduates in terms of how long they took to graduate from the university. The mean length of time to graduation for the GED subgroup was 5.6 years, while for the HS group it was 5.3 years. Noteworthy results, however, were obtained when comparing students of different age categories within the two study groups.

Age-Related Differences in Graduation Status

Although originally not one of the study questions, it was noticed in the course of analysis that there appear to be age-related differences in graduation rate. An additional analysis was conducted to determine if these differences were significant. All participants were divided into two groups: those who enrolled at the university at age 20 or younger (to represent more traditional age students) and those who were older than 20. Chi-square tests were used to determine whether, in fact, there were significant differences in graduation rates between older and younger students from both GED and HS groups. Table 12 presents the results of this analysis.

Table 11

Years to Graduation for GED and HS Graduates

Status	Years to graduation	Frequency	Percent	Cumulative percent
GED graduates	3	1	5%	5%
	4	5	25%	30%
	5	6	30%	60%
	6	3	15%	75%
	7	1	5%	80%
	8	3	15%	95%
	9	1	5%	100%
Total		20	100%	
HS graduates	4	14	35%	35%
	5	16	40%	75%
	6	4	10%	85%
	7	2	5%	90%
	8	2	5%	95%
	10	2	5%	100%
Total		40	100%	

Independent sample *t*-tests of mean years to graduation (for those who graduated) ($\alpha \leq .05$): $t = .694$, $df = 58$, $p = .49$.

Table 12

Age-Related Differences in Graduation Rates of GED and HS Graduates

STATUS	Age group at enrollment		Graduated		Total
			No	Yes	
GED graduates	17-20	N	55	8	63
		Percent within Age Group	87.3%	12.7%	100.0%
	21+	N	66	12	78
		Percent within Age Group	84.6%	15.4%	100.0%
	Total	N	121	20	141
		Percent within Age Group	85.8%	14.2%	100.0%
HS graduates	17-20	N	24	28	52
		Percent within Age Group	46.2%	53.8%	100.0%
	21+	N	71	12	83
		Percent within Age Group	85.5%	14.5%	100.0%
	Total	N	95	40	135
		Percent within Age Group	70.4%	29.6%	100.0%

Note: **Differences between older and younger HS graduates significant at .01 level (age at enrollment appears to be significantly related to graduation). $\alpha \leq .05$

It appears from Table 12 that the graduation rate within the GED group was similar for older and younger students: out of those who enrolled at the university between the ages 17-20, 12.7% have graduated, and out of those who were older than 20 at enrollment, 15.4% have graduated. However, although older students within the HS group also graduated at a similar rate (14.5%), the younger students had a much higher graduation rate (53.8%). These findings are by no means conclusive, especially because some of the students might take as long as 10 years to graduate and the students from this sample who enrolled in 1997 only had 4 years within the limits of this study. However, this limitation has applied to both groups of participants; therefore the above data can be considered meaningful.

Chi-square tests were used to determine whether the age-related differences were significant. Table 13 presents the results of this analysis. It shows that age-related differences between older and younger students were, indeed, significant within the HS group but not significant within the GED group.

Table 13

Chi-square of Differences Between Older and Younger Participants in Graduation Rates for GED and HS Groups

Variable	Group	Chi-square	df	Significance
Graduation (by age)	GED graduates	.207	1	$p=.65$
	HS graduates	23.79	1	$p<.001$

$\alpha \leq .05$

Drop-Out Status

There were 119 GED graduates and 98 HS graduates who dropped out of the university before graduating. This section addresses the following question concerning their academic status at the time of dropping out:

Research Question 8. Is there a significant difference in the drop-out status (Good Standing as opposed to Academic Review/Academic Dismissal) between GED graduates and HS graduates?

The academic status at the time of attrition was analyzed using a Chi-square test. Academic status was compared for those students from the two groups who did not graduate, and who were not still enrolled at the university at the time of the study. University records included two academic categories relevant to student attrition: Academic Dismissal and Academic Review. These two categories are described in the official 2000 student handbook of the university as follows:

If a student's cumulative grade point average falls below the minimum acceptable level of 2.0, or if his/her term (semester) GPA falls below 2.0 for two consecutive terms, a student is placed on Academic Review for the subsequent term of enrollment... If, while in review, a student does not obtain a 2.0 GPA for hours attempted that term, the college may recommend that the student be...dismissed. (Hilltopics Student Handbook, 2001, p. 34)

Table 14 presents the academic status in these two categories as well as "good standing" status for those students from both groups who left the university without graduating. It should be noted that the possibility of these students' subsequent re-enrollment cannot be excluded. All that was known at the time of the data collection (summer, 2001) was that these students were not enrolled in either spring or summer, 2001.

Table 14

Academic Status of Students at the Time of Leaving the University

Drop-out status	GED graduates		HS graduates	
	N	%	N	%
Good Standing	52	43.7%	59	62.8%
Academic Review	48	40.3%	24	25.5%
Academic Dismissal	19	16.0%	11	11.7%
Total	119	100.0%	94	100.0%
Missing			4	

Note: Differences between GED and HS groups in the academic status significant at .05 level ($\alpha \leq .05$)

Chi-square = 8.12, $df = 2$, $p = .017$

A Chi-square test was used to analyze the difference between GED and HS graduates. This difference was found to be significant at the .05 level, suggesting that GED graduates were more likely than were HS graduates to leave the university because of low academic performance.

As shown in Table 14, 52, or 43.7%, of GED graduates left the university in Good Standing status, while 48, or 40.3%, left in Academic Review status and 19, or 16.0%, were in Academic Dismissal. On the other hand, among the HS graduates, 59, or 62.8%, left in Good Standing, 24, or 25.5%, left in Academic Review and 11, or 11.7%, in Academic Dismissal. In other words, a total of 67 (56.3%) GED graduates left the university in the status of either Academic Review or Academic Dismissal. Among the

HS graduates, a total of 35 (37.2%) left the university in one or the other academic-related status.

Prediction Factors

The last question addressed in this study considers the possibility of predicting, after the freshman year, the probability of GED graduates' successful completion of the baccalaureate degree. The variables chosen for this model were GED score, first and second semester grade point average, and completed credit hours in relation to attempted credit hours in the first and second semester. College entrance tests (ACT/SAT) were available for only approximately 50% of the sample and therefore were not included in the prediction model.

Research Question 9. To what extent can the combination of the GED test score, first semester GPA, second semester GPA, and first and second semester ratio of completed and attempted credit hours predict graduation rates among GED graduates?

Binary logistic regression analysis, which yields a Chi-square statistic, was conducted to determine whether or not the combination of the GED test score, first semester GPA, second semester GPA, and first and second semester ratio of completed and attempted credit hours could predict students' graduation from the university.

Table 15 presents results of the regression and the Chi-square statistic. It was found that these five factors predicted the graduation of GED recipients with an accuracy of 81.7%. Out of 74 GED holders who did not graduate from the university, the model was correct in predicting 68. Of the 19 GED holders who did graduate, the model correctly predicted 8. This relatively low predictive value of a successful outcome is not unusual in studies of disadvantaged populations, including low-income or under-educated adults. According to Hosmer and Lemeshow (2000), it was quite typical for a logistic

Table 15

Logistic Regression Classification Table

Observed graduation	Predicted graduation		Percentage correct
	No	Yes	
No	68	6	91.9%
Yes	11	8	42.1%
Overall percentage			81.7%

Chi-square = 34.87, $df = 5$, $p < .001$

regression model not to be effective in predicting success in the populations that have a low chance of success.

The model accurately predicted 91.9% of those who did not graduate from the university and 42.1% of those who did graduate. However, because only 20 GED recipients graduated (and one of these records could not be included in the model because there was no second semester GPA due to withdrawal), the accuracy of the model in relationship to these participants is not conclusive.

Another way to describe the significance of the model is to use the Hosmer-Lemeshow test to separate the participants into groups according to the scores of variables in the models. In the first five groups of 9 participants each (starting with those with the lowest scores), not a single person (0%) has graduated; in the sixth group of 9 participants, 1 person (11%) graduated; in the seventh group, 4 participants (44%) graduated; in the eighth and ninth groups of 9 participants, 3 persons (33%) in each graduated; and in the tenth group of 12 people (those with the highest scores of model variables), 8 (67%) graduated.

Overall, the model was statistically significant. Table 16 shows all five variables in the equation and their respective significance.

The Wald statistic and the corresponding significance level test the significance of each of the covariate and dummy independents in the model. The Exp(B) column is SPSS's label for the odds ratio of independent variables with the dependent. As shown in Table 16, GED score was the only statistically significant predicting variable in the equation. The relationship between GED scores and graduation was explored further using the independent sample *t*-tests. The results of this analysis are summarized in Table 17.

Table 16

Variables in the Equation Predicting Graduation from the University

Independent Variable	B	Standard Error	Wald statistic	df	Significance	Exp(B)
First semester GPA	-.08	.62	.02	1	$p = .90$	.92
Second semester GPA	.41	.48	.76	1	$p = .38$	1.51
GED test score	.18	.07	6.40	1	$p = .01$	1.20
First semester credit hours ratio	.05	.03	2.23	1	$p = .14$	1.05
Second semester credit hours ratio	2.18	1.41	2.38	1	$p = .12$	8.78

$\alpha \leq .05$

Table 17

Independent Samples T-tests of Differences in GED Scores Between Those Who Graduated and Did Not Graduate from the University

Graduated from the university?	N	Mean GED score	<i>t</i>	<i>df</i>	Significance
Yes	20	62.4	-3.45	137	<i>p</i> =.001
No	119	57.9			
$\alpha \leq .05$					

Table 17 shows that those GED recipients who graduated from the university had significantly higher scores on the GED test than those who did not, although both groups had quite high GED scores (the passing GED score in Tennessee is 45). It should be noted that the *t*-test results reported in Table 17 are based on the results of the Levene's test of equality of variances (equal variances are assumed in this case).

The average GED score of those freshmen who graduated was 62.4, while for those who did not graduate it was 57.9 ($t = -3.45$). Based on the results reported in Tables 16 and 17, it can be concluded that GED score can, in fact, be an effective predictor of graduation from the university. It is important to bear in mind, however, that as the logistic regression model was much more effective in predicting those who did not graduate than in predicting those who did, it indicates that some seemingly low-performing students can eventually graduate from the university. More research on such students could shed light on what factors and characteristics helped them achieve academic success.

Summary

Graduation rate was found to be significantly lower for the GED graduates than for the HS graduates. The grade point average was significantly lower for the GED graduates in the first and the second semester but there was no significant difference between the groups in later semesters. The rate of completion of attempted credit hours in the first and second semester was also lower for the GED graduates. More GED graduates than HS graduates left the university in the status of either Academic Review or Academic Dismissal. By the third semester, cumulative attrition was higher for the GED graduates than for the HS graduates and eventually led to a lower graduation rate among the GED graduates. The differences in graduation rates, however, were not the same for older and younger students in both groups. Although younger HS graduates graduated from the university at a much higher rate than older students from both the GED and HS groups, younger GED recipients' graduation rate was just as low as that of older students. GED scores were found to be significantly higher for those GED recipients who later graduated from the university than for those who did not.

Taken together, these findings indicate that GED graduates might not be sufficiently prepared for the requirements of a rigorous academic pursuit in a large research university. Whether students prepare for the GED test independently or in Adult Basic Education (ABE) programs, they should not assume that this credential automatically brings them to the same level of college preparedness as that of students who have had the experience of coping with the load of high school courses. Adult Basic Education teachers and staff need to be aware of their students' goals in order to help

provide additional support to those students who plan to pursue higher education after they pass the GED test.

The findings also included a model attempting to predict graduation from the university based on the combination of the GED score, first and second semester GPA, and first and second semester credit hours. The model was more effective predicting non-graduation than graduation. GED score was the only statistically significant component of this model.

Based on the results on this study, GED score appears to be a relatively effective predictor of a freshman's graduation from the university. Adult educators and student services professionals should pay attention to the GED scores of freshmen with this credential and offer those with lower scores some services they may need. Additional research could help them gain a better understanding of what these services might be. These and other implications for practice and research are discussed further in the next chapter.

CHAPTER 5

Conclusions, Recommendations, and Implications

The previous chapter described the findings of this study. It includes statistical tests and tables presenting results. This final chapter summarizes the study's purpose, research questions, procedure, and findings. Discussion and conclusions from the findings are also included in this chapter, followed by several recommendations for practice and further research.

Purpose of the Study

The GED has provided a secondary education alternative to thousands of high school (HS) dropouts who plan to pursue further education. The purpose of this study was to determine whether academic performance and attrition rates differed for the GED and HS school graduates who enrolled at The University of Tennessee as freshmen between 1988 and 1998. The study also examined the extent to which selected factors could be used to predict GED graduates' success at a major research university.

Procedure

The data for this project were collected from existing university records. Study participants included all GED graduates admitted to the university as incoming freshmen during fall semesters between 1988 and 1998. A comparison group was selected randomly from all HS graduates from those years and was stratified by age. The HS group was similar to the GED group in gender, racial, and marital status composition.

Research Questions

Nine research questions were addressed in this study. The questions are listed below:

1. Is there a significant difference in the first semester grade point average (GPA) between GED graduates and HS graduates?
2. Is there a significant difference in the second, third, and fourth semester GPA between GED graduates and HS graduates?
3. Is there a significant difference in the number and ratio of attempted and of completed credit hours after the first semester between GED graduates and HS graduates?
4. Is there a significant difference in the number and ratio of attempted and of completed credit hours after the second semester between GED graduates and HS graduates?
5. Is there a significant difference in the rate of attrition after the first semester between GED graduates and HS graduates?
6. Is there a significant difference in the rate of attrition after the second, third, and fourth semesters between GED graduates and HS graduates?
7. Is there a significant difference in the graduation rates between GED graduates and HS graduates?
8. Is there a significant difference in the drop-out status (good standing as opposed to academic review/academic dismissal) between GED graduates and HS graduates?
9. To what extent can the combination of the GED test score, first semester GPA, second semester GPA, and first and second semester ratio of completed and attempted credit hours predict graduation rates among GED graduates?

These research questions were addressed in detail in Chapter 4. The following section summarizes the findings based on quantitative analysis.

Summary of Findings

Quantitative methods of data analysis used to answer the research questions below included Chi-square tests, independent samples *t*-tests, and binary logistic regression. The next sections present the findings by clusters of research questions.

Research Questions 1 and 2: Grade Point Average

Grade point average was significantly lower for the GED graduates in the first and the second semesters, but there was no significant difference between the groups in the later semesters. In the first semester, the mean GPA for HS graduates was 2.51, while for GED graduates the mean GPA was 1.98. In the second semester, HS graduates' mean GPA was 2.4 and GED graduates' was 1.85. In the third semester, the GPA of HS graduates was 2.51, and of GED graduates, 2.23. And in the fourth semester, HS graduates' mean GPA was 2.54, and GED graduates', 2.27. These findings indicate that GED graduates did not perform as well in the first two semesters as did HS graduates; however, those GED graduates who persisted into the third and fourth semesters did not differ significantly in their GPA from HS graduates.

Research Questions 3 and 4: Attempted and Completed Credit Hours

In the first and second semesters, GED graduates completed significantly fewer of their attempted credit hours than did HS graduates. For HS graduates, the average first semester ratio was .83 (meaning that out of all the credit hours attempted by these students, 83% were completed), while for the GED graduates 67% of attempted hours were completed. In the second semester, high school graduates completed 78% of attempted hours, while GED graduates completed 66%. Again, this difference was statistically significant.

Research Questions 5 and 6: Attrition

During the first semester, 14% of GED graduates and 10.1% of HS graduates dropped out of the university. By the end of the second semester, the cumulative attrition (drop-out rate) was 34.3% for GED graduates and 28.2% for HS graduates. The third and fourth semester cumulative attrition was, respectively, 52.4% and 59.4% for GED graduates and 38.5% and 46.6% for HS graduates. During the first two semesters, there was no significant difference in drop-out rates between the GED and HS graduates. By the third semester, however, the difference in cumulative attrition between the two groups became significant and also was significant during the fourth semester.

Research Question 7. Graduation

Graduation rate was found to be significantly lower for GED graduates than for HS graduates. Of the 141 GED graduates who had had at least four years to graduate from the university (those admitted before 1998), only 20 (14.2%) have graduated. Of the 135 high school graduates who had no less than four years to graduate, 40 (29.6%) have graduated.

No significant differences were found between the GED graduates and the HS graduates in terms of how long they took to graduate from the university. The mean length of time to graduation for the GED subgroup was 5.6 years and for the HS group, it was 5.3 years. Interesting results, however, were obtained when comparing students of different ages within the two study groups.

There were significant differences found in the graduation rates between older and younger HS graduates (but not for GED graduates). The graduation rate within the GED group was similar for older and younger students: of those who enrolled at the

university at the age 17-20 years, 12.7% have graduated, and of those who were older than 20 years at enrollment, 15.4% have graduated. However, although older students within the HS group also graduated at a similar rate (14.5%), the younger students had a much higher graduation rate (53.8%). This may suggest that traditional-age GED students experience difficulties or obstacles that are not relevant for HS graduates of similar age.

Research Question 8. Drop-out Status

A significantly greater number of GED graduates than HS graduates left the university under the status of either Academic Review or Academic Dismissal. A total of 67 (56.3%) GED graduates left the university in the status of either Academic Review or Academic Dismissal. Among the HS graduates, a total of 35 (37.2%) left the university in one or the other academic status. This suggests that GED graduates were more likely than HS graduates to leave the university because of low academic performance.

Research Question 9. Predicting Graduation from the University

I conducted a binary logistic regression analysis to determine whether or not the combination of GED test score, first semester GPA, second semester GPA, and first and second semester ratio of completed and attempted credit hours could predict students' graduation from the university. I found that these five factors predicted the graduation of GED recipients with 81.7% accuracy. Although the model accurately predicted 91.9% of those who did not graduate from the university, it accurately predicted only 42.1% of those who did graduate.

Overall, the model was statistically significant, and the GED score was the only significant predicting variable in the equation. The relationship between GED scores and the graduation was explored further using the independent samples *t*-tests. Those GED

recipients who graduated from the university had significantly higher scores on the GED tests than did those who did not graduate. It can be concluded that GED score can, in fact, be an effective predictor of graduation from the university.

Discussion

The results of the present investigation suggest that GED graduates might not perform in a public research university as well as HS graduates do. This is consistent with some findings from the existing research and policy-related literature on GED graduates in four-year colleges and universities. For instance, Green (2002) writes in the *City Journal*, an urban-policy magazine:

The GED holders who go on to post-secondary education (about 60 percent) ... compare poorly with high school grads who do so. Almost three-quarters of GED holders who enroll in community colleges fail to finish their degrees, compared with 44 percent of high school graduates. In a four-year college, the prospects are even grimmer: ... an astonishing 95 percent of GED holders don't finish, compared with 25 percent of high school grads. (p. 83)

Quinn (1986) also found that GED graduates did not perform as well as did HS graduates in The University of Wisconsin system. Sultan (1989) found that those GED graduates who received baccalaureate degrees from two Mississippi institutions took longer to graduate than HS graduates did. However, the present study did not find this difference for the participants who graduated from The University of Tennessee. Colert (1983) did not find significant differences in GPA and completed credit hours between GED and HS graduates. Both Colert and Sultan (1989) found that there were more female than male students among the GED graduates in their studies who were enrolled in four-year institutions; in the present study, however, there were more male than female participants within the study population.

The results of this study suggest that GED graduates enrolled as freshmen in institutions of higher education, particularly those with lower GED scores, might not be adequately prepared for the rigorous academic load of the university. Even HS graduates often experience difficulties during the early semesters. It can be expected that for people without a sufficient experience of high school coursework (that is more similar to that of a university than earlier stages of schooling), these difficulties could be much more pronounced. Green (2002) in the *City Journal* article on the GED suggests that

In high school, you learn to put up with all sorts of irritations, from mind-numbing boredom to taking an exam you don't feel like studying for or dealing with a teacher who treats you like a moron - or is one herself. The kind of maturity and tolerance for rules that one develops in submitting to such common trials proves invaluable later on in higher education and in the workforce, where unwelcome tasks and maddening people can be regular facts of life. GED preparatory courses don't offer anything comparable. GED students come when they want, leave when they want, and work at their own pace; they lack formal instruction, assignments, and due dates. This ... approach might make it easier for some motivated students to jump the GED hurdle swiftly and move on to college or work. But it's a recipe for further failure for the many GED seekers who are poorly socialized and lacking in structure and discipline already. (p. 84)

When investigating academic performance of GED graduates, it is important to keep in mind that these people have dropped out of high school before they enrolled in colleges. They might either find the formal institutional setting incompatible with their personalities or have certain barriers that impede their performance in such a setting. However, after they received their GED, going to college means returning to a setting very similar to what they left in high school. Perhaps GED graduates could benefit from special adjustment services in their first year of college that will help them make a successful transition to a formal academic environment. This is consistent with recommendations from other researchers (for example, Colert, 1985, as cited in Sultan,

1989; Junne, 1988; Rogers, 1987; Scales, 1989). Biermann and Platt (1992) described a “GED Support Seminar” that was found effective in the Kingsborough Community College. However, no similar examples of support services were found in the reviewed literature on four-year colleges or universities.

Some studies (for example, Banner, 1989; Smith & Goetz, 1988) found the GED to be as good a predictor of college success as other admissions tests typically used with high school graduates. Quinn (1986), to the contrary, did not find GED score an effective predictor of college success. The present study did find that the students who successfully graduated from the university had higher GED scores than did those who did not graduate.

To summarize, the findings of this study agreed with some of the existing studies on GED graduates’ college performance but disagreed with others. A reason for this is that some previous studies found no significant differences between GED graduates’ and HS student graduates’ performance while others found that GED graduates did not perform as well in terms of their grades, retention, and graduation. The present study clearly falls in this latter category. In most of the study variables GED graduates’ performance was found to be lower than that of HS graduates. GED graduates’ GPA was lower in the first two semesters (although not in the third and fourth semesters); they did not complete as many credit hours in the first two semesters as did HS graduates; they more frequently left the university in the status of Academic Review or Academic Dismissal; and, finally, their graduation rate was lower.

Of particular interest was the finding that, although graduation rate for traditional-age HS graduates was quite high (53.8%, as compared with 14.5 % for older students),

both older and traditional-age GED students had similarly low graduation rates (15.4% and 12.7%, respectively). This could suggest that, regardless of age, GED graduates could have certain deterrents in their lives that are absent from lives of traditional-age HS graduates. These barriers might be similar to those experienced by older HS graduates. However, a guess could be ventured that difficulties experienced by mature learners, such as family and work responsibilities, may be combined for GED graduates with insufficient academic preparation. Significantly more GED graduates than HS graduates left the university in either Academic Review or Academic Dismissal status (56% and 80%, respectively).

Cross (1981) identified the following categories of perceived barriers to learning: situational (cost, home responsibilities, job); institutional (course schedule, "red tape"); and dispositional (lack of confidence; being tired of school; not enough energy). The present study investigated college performance of GED graduates who had dropped out of school previously, perhaps because of some of these barriers. There is a possibility that these same barriers are still present in their lives, therefore preventing them from persisting and succeeding in higher education. Perhaps an additional orientation for GED graduates could better prepare them for the academic challenges ahead.

The findings about GED graduates' academic performance at the university are somewhat troubling. However, this study has also found evidence that the GED test score could be meaningful for predicting future accomplishments in higher education. The passing GED score in Tennessee is 45. However, most participants in this study had higher scores, with both the mean and median being 58. GED scores for those participants who graduated from the university were significantly higher than for those

who did not (mean score was 62 for those who graduated and 58 for those who did not). These findings could indicate that a much higher than passing GED score might be needed for successful performance in college.

Implications for Practice

The findings of this study could help provide greater understanding of GED graduates' university performance in terms of whether these nontraditional students can be as successful in four-year institutions as randomly selected high school graduates with similar demographics. These understandings could help inform the practice of student services, as well as fill an existing void in the body of knowledge about the extent to which the nature of high school credentials can affect academic performance of university students.

The findings suggest that, because GED graduates did not perform as well as HS graduates, there could be a need for special services (support, advising) and for remedial courses for freshmen with a GED credential, particularly for those with lower GED scores (a cut-off score of 60 could be tentatively suggested). Additional freshman orientation and study skills classes could also be helpful for this population. Because of lack of sufficient preparation for academic environment, including large classes, a transitional program with small study groups during the first semester might be beneficial.

Although outside the scope of this study, it was observed that more GED graduates in the university tended to carry a full-time load than did HS graduates. Both financial aid and vocational rehabilitation programs usually require full-time enrollment, and many GED graduates may seek tuition payment relief provided by these programs,

even though they might benefit from an option of part-time academic load, especially during their freshman year. To determine how to make GED graduates' pursuit of baccalaureate degrees more successful, these issues should be investigated further. It might be recommended that a transitional program for GED graduates during their first semester could take the place of mandatory full-time first and second semester load. The program might include two traditional or remedial courses and two seminars that would help students to make a transition into college. In some cases, financial aid might be provided during the freshman year for GED graduates who attend on a part-time basis, particularly if there are family and work obligations.

This study also has implications for the preparation of GED test takers. It was found that those participants who graduated from the university had significantly higher GED scores than those who did not. This finding could mean that a better preparation for the GED, resulting in a higher test score, may increase the students' chances of successful graduation from college. Researchers and practitioners in the field of ABE should look more closely at the possible ways to increase GED scores of those participants who plan to enroll in postsecondary education.

Some individuals prepare for the GED independently, usually with the help of a GED textbook. Others attend Adult Basic Education (ABE) classes geared toward the GED or special GED preparation courses. Most ABE programs do not specifically address college preparation needs of those GED takers who plan to pursue higher education. However, through participation in a discussion on the National Literacy Advocacy (NLA) listserv, I have obtained information on attempts by basic education programs to address these needs. Three ABE practitioners participating in this discussion

described college transition programs for GED graduates. One described a college transition prep program for GED graduates sites. Another practitioner mentioned special services offered by the ABE program to the GED graduates who have intentions of going on to technical school and/or college. And the third program has a counselor on site whose job includes assisting students who are interested in going to college. This assistance includes teaching study skills and test taking skills, as well as helping with the processes of applying for admission and for financial aid (personal communication, December, 2000). Although these programs saw such services as valuable in increasing relevant skills and confidence of GED graduates preparing for college, no formal evaluation of these efforts has been conducted so far. If an evaluation found these efforts to be successful, they could be well worth studying and developing further by other GED preparation programs.

From the NLA discussion, I learned about a perceived need by teachers and administrators in certain ABE/GED preparation programs to include at least some elements of college readiness. In the course of the NLA discussion, many more ABE practitioners expressed an interest in whether GED recipients perform well in college. At the same time, some ABE practitioners stated an opinion that the GED was never intended to become a version of a high school curriculum and certainly not of a college-preparation curriculum. These differences of opinion suggest that the role of the GED needs to be discussed further among the ABE practitioners. It might be concluded that the need for college transition for GED graduates is noticed by ABE practitioners, and that some elements of the transition could occur while GED takers are still attending ABE programs.

Recommendations for Further Research

This study has attempted to create a greater understanding of performance of GED graduates in a university setting. Such an understanding could fill a gap in adult and higher education research. Although the number of GED takers is increasing, and although many of these individuals plan to pursue higher education, very little is known about their performance in universities and four-year colleges. The results of the current study suggest that GED graduates might not be adequately prepared for rigorous academic pursuits in such institutions. However, this research was limited to one institution, where only 143 GED graduates were enrolled as incoming freshmen between 1988 and 1998. Utilizing quantitative methods for analyzing existing data, this investigation pointed out certain performance differences between GED and HS graduates and also within the group of HS graduates. However, the author did not collect any information that could potentially explain these differences. Several recommendations can be made based on the above discussion.

1. *Replicating this study on a larger scale, with the involvement of several different institutions.* This would provide more material for statistical analysis, which could make the findings more generalizable. Such a study would be particularly important after major changes in the GED test beginning in January 2002. The major 2002 changes in GED are summarized by the American Council on Education (2002):

GED candidates can expect to encounter more business-related and adult-context information texts across all five tests. The 2002 Series tests reflect the impact of welfare-to-work legislation and the increased emphasis on academic standards in the K-12 community. The 2002 Series GED... carries an increased emphasis on organization and has implemented a new scoring scale for ... the timed essay portion.... All GED candidates must use the Casio fx-260 Solar calculator during testing.

2. *Conducting interviews with GED graduates who enrolled in universities and four-year colleges and complementing these qualitative data with comprehensive study of the participants' academic records.* This could give researchers a better understanding of GED graduates' postsecondary pursuits, especially about difficulties they experience during early semesters. It would be particularly valuable to conduct interviews with both baccalaureate graduates and college dropouts, as well as extensively study their records. Such a study will help to determine "success" factors which influence whether a GED-recipient will be able to graduate from a university.
3. *Conducting an investigation of those GED graduates who enroll in the four-year institutions after completing two years at the community colleges.* The goal of such a study would be to determine whether such students were more successful in receiving Baccalaureate degrees than GED graduates who enrolled in four-year institutions as freshmen.
4. *Exploring the potential of those programs that target GED takers whose goal is to enroll in institutions of higher education.* An evaluation of effectiveness of such programs could help determine whether college preparation should become a more prominent component of ABE/GED preparation programs.
5. *Investigating dispositional and other deterrents that may influence students' persistence and achievement in higher educational setting.* It would be particularly interesting to compare these deterrents for traditional-age and older and other groups of non-traditional students. Differences between full-time and part-time students could also be examined.
6. *Investigating dispositional and other characteristics that may correlate with success in higher education.* Such a study may focus both on the personality traits and on the life circumstances of GED graduates who were successful in college, to see whether there were no deterrents in successful participants' lives (see recommendation 5 above) or certain factors enabled the participants to overcome these deterrents.
7. *Examining what academic and other characteristics lead to higher scores on the GED test.* The present study shows a positive correlation between GED scores and graduation from the university. By learning more about what might increase GED takers' scores on the test, researchers may improve their chances for success in college.
8. *Conducting a study of high school drop-outs who achieved their secondary credential via the routes of an adult high school or a vocational school, rather than by passing the GED test.* Comparing their performance with that of GED graduates could explain whether such secondary programs, more similar to

traditional high schools, can prepare future college students better than GED programs.

9. *Exploring the impact of GED scores on a wide range of indices, such as college graduation, employment, and income.* This study seems to indicate a positive correlation between the GED score and college graduation. Perhaps more data could help us understand the relationship between the GED score and other variables.
10. *Exploring institutional implications of the low performance of GED graduates.* As institutions of higher education attempt to open their doors to populations formerly known as “disadvantaged,” it is important to understand what low performance of such groups mean for institutional policy.

Closing Comment

Most people see educational achievements as relatively hard to accomplish. A GED graduate’s educational history can often be even more arduous than that of an average person. It is encouraging to see that many GED graduates succeeded in the university; some study participants later went to graduate school and received advanced degrees. The majority of freshmen with a GED credential, however, did not receive a Baccalaureate degree. These are not the findings for which the author, who holds a deep interest in ABE and its students, had hoped. Without assuming that ALL freshmen perform equally well and informed by contradictory findings from previous research on GED graduates’ performance, the author investigated how 143 study participants fared in college, wishing that her study proved them as successful as high school graduates. That was not what was found; but it can be hoped that this study will provide an additional motivation for adult and higher educators to develop means that can help the future GED graduates to succeed in colleges and universities.

The GED is seen by thousands of people as a path to educational opportunities that would not be available to them otherwise. The question raised by this study is: How can the GED be better used to ensure its graduates a better success in higher education? Perhaps, the results of this study will prompt researchers and practitioners of student services and adult basic education to continue to work to resolve this question and truly ensure that GED leads to what it was intended to do – to improve hope and opportunities for people who might otherwise not be able to pursue higher education.

REFERENCES

References

- ACE survey finds GED test-takers seeking advanced education. (1985, October). *Phi Delta Kappan*, 67, 166-167.
- Ackell, E. (with Epps, R., Sharp, N., & Sparks, H.) (1982, January). Adapting the university to adult students: A developmental perspective. *Continuum*, 46(1), 30-35.
- Allen, C., & Jones, E. (1992). *GED testing program: The first fifty years*. Washington, DC: American Council on Education.
- American Council on Education (2002). Retrieved on April 8, 2002, from <http://www.acenet.edu/calec/ged/test2002-A.html>
- Anderson, W. H. (1972). *Characteristics of adult evening college students*. Unpublished doctoral dissertation, The University of Tennessee.
- Astin, A. (1993). *What matters in college? Four critical years revisited*. San Francisco: Jossey-Bass.
- Banner, D. V. (1989). *The tests of general educational development as predictors of student performance in five programs at Asheville-Buncombe Technical Community College for the years 1982-1988*. Unpublished doctoral dissertation, University of North Carolina at Greensboro.
- Benshoff, J. M. (1991). Nontraditional college students: A developmental look at the needs of women and men returning to school. *Journal of Young Adulthood and Middle Age*, 3, 47-61.

- Benshoff, J. M., & Lewis, H. (1992). *Nontraditional college students*. Ann Arbor, MI: ERIC Clearinghouse on Counseling and Personnel Services. (ERIC Document Reproduction Services No. ED347483)
- Biermann, C. A., & Platt, N. D. (1992). A community college support seminar for GED freshmen. *Journal of College Science Teaching*, 22, 89-91.
- Boesel, D., Alsalam, N., & Smith, T. M. (1998). *Research synthesis: Educational and labor market performance of GED recipients*. Washington, DC: U.S. Department of Education.
- Carnegie Foundation for the Advancement of Teaching. (1988). The GED: A growing alternative route to higher education. *Change*, 21, 35-39.
- Cervero, R. M. (1983). A national survey of GED test candidates: Preparation, performance, and 18-month outcomes. *Adult Literacy and Basic Education*, 7(1), 13- 29.
- Colert, S. (1983). *High school equivalency and high school diploma students at Brandon University: A comparison of academic success*. Washington, DC: GED Testing Service.
- Commission on Non-Traditional Study. (1973). *Diversity by design*. New York: Author.
- Cross, K. P. (1980, May). Our changing students and their impact on colleges: Prospects for a true learning society. *Phi Delta Kappan*, 61(9), 627-632.
- Cross, K. P. (1981). *Adults as learners*. San Francisco: Jossey-Bass.
- The difference age makes: GED profiles. (1995, Winter). *Educational Record*, 76, 60.

- Etaugh, C., & Spiller, B. (1989, January). Attitudes toward women: Comparison of traditional-aged and older college students. *Journal of College Student Development, 30*(1), 41-45.
- Firenze, L. (1984). Educational objectives of traditional vs. nontraditional alumni at one institution: A brief report. *Lifelong Learning, 7*(2), 13-14.
- Fisher, J. C. (1985). Liberal art colleges and the older students. *Lifelong Learning, 8*(6), 6-7.
- GED Testing Service. (1999). *Who took the GED? GED 1998 statistical report*. Washington, DC: Author.
- Green, J. (2002, Winter). GED's aren't worth the paper they're printed on. *City Journal, 12*(1), 82-87.
- Hall, G. S. (1990). *Work attitudes of traditional and non-traditional technical community college students*. Unpublished master's thesis, The University of Tennessee.
- Hammon, D. (1995). *Educational, employment, and personal benefits derived from earning a general educational development (GED) certificate: A follow-up study of Idaho's 1992 GED graduates*. Unpublished doctoral dissertation, University of Idaho.
- Hilltopics Student Handbook. (2001). Retrieved October 29, 2001, from <http://web.utk.edu/~homepage/hilltopics/default.html>
- Hosmer, D., & Lemeshow, S. (2000). *Applied logistic regression*. New York: John Wiley & Sons, Inc.
- Hu, M. (1985, Spring). Determining the needs and attitudes of non-traditional students. *College and University, 60*(3), 201-209.

- Johnson, M., & Valentine, T. (1992). *Outcomes of GED graduation: An annotated bibliography of research reports*. Athens: The University of Georgia.
- Junne, H. J. (1988). *The GED college graduate: A profile of Detroit-area community college graduates who were high school dropouts*. Unpublished doctoral dissertation, University of Michigan.
- Kasworm, C. E. (1993). Adult higher education from an international perspective. *Higher Education*, 25, 411-423.
- Kasworm, C. E., & Pike, G. R. (1994). Adult undergraduate students: Evaluating the appropriateness of a traditional model of academic performance. *Research in Higher Education*, 35(6), 689-710.
- Kerka, S. (1989). *Retaining adult students in higher education*. ERIC Clearinghouse on Adult, Career and Vocational Education (ERIC Document Reproduction Service No. ED308401)
- Knowles, M. (1969). *Higher education in the United States: The current picture, trends, and issues*. Washington, DC: American Council on Education.
- Kroll, B. S. (1993). *Does the key fit the lock? A review of research on GED recipients in community colleges*. New Brunswick, NJ: Rutgers University. (ERIC Document Reproduction Service No. ED 377 893)
- Lacefield, W. E., & Mahan, J. M. (1988). Factors influencing satisfaction of non-traditional students with mainstream graduate programs. *Educational Research Quarterly*, 12(2), 36-50.
- Meeks, K. I. (1989). *A comparison of adult versus traditional age mathematics students and the development of equations for the prediction of student success in*

developmental mathematics at The University of Tennessee – Chattanooga.

Unpublished doctoral dissertation, The University of Tennessee.

Metzner, B. S., & Bean, J. P. (1987). The estimation of a conceptual model of nontraditional undergraduate student attrition. *Research in Higher Education*, 27(1), 15-38.

Murnane, R., Willett, J., & Boudett, K. (1995). Do high school dropouts benefit from obtaining a GED? *Educational Evaluation and Policy Analysis*, 17(2), 133-147.

National Center for Education Statistics. (1996, November). *Nontraditional undergraduates: Trends in enrollment from 1986 to 1992 and persistence and attainment among 1989-90 beginning postsecondary students*. Washington, DC: U.S. Department of Education.

Norusis, M. (2000). *SPSS 10.0 guide to data analysis*. Upper Saddle River, NJ: Prentice-Hall, Inc.

Pappas, J. P., & Loring, R. K. (1985). Returning learners. In L. Noel, R. Levitz, D. Saluri, & Associates (Eds.), *Increasing student retention: Effective programs and practices for reducing the dropout rate* (pp. 138-161). San Francisco: Jossey-Bass.

Quinn, L. M. (1986). *Performance of GED holders enrolled at The University of Wisconsin's thirteen campuses: 1979-1985*. Milwaukee:: University of Wisconsin. (ERIC Document Reproduction Service No. ED 274 813)

Richter-Antion, D. (1986, Winter). Qualitative differences between adult and younger students. *NASPA Journal*, 23(3), 58-62.

- Rogers, J. D. (1987). *The high school equivalency graduate and the high school diploma graduate: A comparison of student backgrounds and academic performance at The University of Arkansas*. Doctoral dissertation, University of Arkansas. Ann Arbor, MI: UMI Dissertation services.
- Sabino, M. J., & Seaman, D. F. (1988). Follow-up of GED completers: An analysis of eight studies in the U.S. and Canada. *Lifelong Learning*, 11(7), 4-6.
- Scales, N. J. (1989). *A comparison of the academic achievements of high school graduate diploma students and general educational development credentialized students in selected junior college institutions in Alabama*. Unpublished doctoral dissertation, University of Alabama.
- Schlossberg, N. K., Lynch, A. Q., & Chickering, A. W. (1989). *Improving higher education environments for adults*. San Francisco: Jossey-Bass.
- Smith, G. S., & Goetz, E. T. (1988). Using the GED for college placement. *College and University*, 63, 360-367.
- Snyder, B. (1997, Summer). Special students, special services. *Torchbearer*, 36(2), 5.
- Soltz, D. F. (1996). The achievements of community college students with GED certificates: A longitudinal perspective. *Community College Journal of Research and Practice*, 20, 269-276.
- Sultan, M. H. (1989). *Academic performance of GED recipients in two four-year postsecondary institutions in Mississippi*. Doctoral dissertation, University of Southern Mississippi. Ann Arbor, MI: UMI Dissertation Services.
- Terrell, P. S. (1990, Spring). Adapting institutions of higher education to serve adult students' needs. *NASPA Journal*, 27(3), 241-247.

- Thompson, H., & Jimmerson, R. (1986). A two year follow-up study of GED recipients in Washington State. *Adult Literacy and Basic Education*, 10(1), 27-36.
- Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition*. Chicago: The University of Chicago Press.
- Welch, W. M. (1980). *A comparison of the academic performance of GED, high school, and college transfer students in an associate of science degree program in nursing*. Unpublished doctoral dissertation, George Peabody College for Teachers of Vanderbilt University.
- Wilson, S. C. (1982). *A comparison of the academic performance of high school graduates and GED certificate holders at Tulsa Junior College*. Unpublished doctoral dissertation, Oklahoma State University.

APPENDIX

Key Variables in the SPSS Database

1. *ID* – participants identification number created by me
2. *Status* – GED graduate or HS graduate
3. *Gedscore* – GED score (for GED graduates only)
4. *Sex* – female or male
5. *Marital* – married or unmarried
6. *Actscore* – ACT score
7. *Race* – Non-White or White
8. *Year* – Year of enrollment in the university
9. *Firstgpa* – First semester GPA
10. *Secgpa* – Second semester GPA
11. *Thirdgpa* – Third semester GPA
12. *Fourgpa* – Fourth semester GPA
13. *Firstatt* – Attempted credit hours for the first semester
14. *Frsternd* - Completed credit hours for the first semester
15. *Secatt* - Attempted credit hours for the second semester
16. *Secernd* - Completed credit hours for the second semester
17. *Grad* – Whether or not the person has graduated from the university
18. *Gradterm* – Semester of graduation from the university
19. *Gradyear* – Year of graduation from the university
20. *Semleave* – Number of semesters attended before leaving the university (only for those who did not graduate)
21. *Lcumhrs* – Number of credit hours completed at the time of leaving (only for those who did not graduate)

22. *Areview* – Academic status at the time of leaving: Good Standing, Academic Review, or Academic Dismissal (only for those who did not graduate)
23. *Inuninow* – Whether the person was still enrolled at the university at the time of data collection.
24. *Comments* – Other information, for example, whether participants attended the university mostly on a part-time or on a full-time basis.

VITA

Olga Ebert was born in Ukraine. She studied English Language and Literature and Teaching English as a Foreign Language at Kharkiv State University where she received a Master of Arts degree in Philology (Study of Languages). She also holds a Master of Science degree in Leadership Studies in Education from The University of Tennessee, Knoxville. Since 1996, she has worked as a researcher at the Center for Literacy Studies at The University of Tennessee. She received the Doctor of Philosophy in Education from The University of Tennessee in 2002.

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